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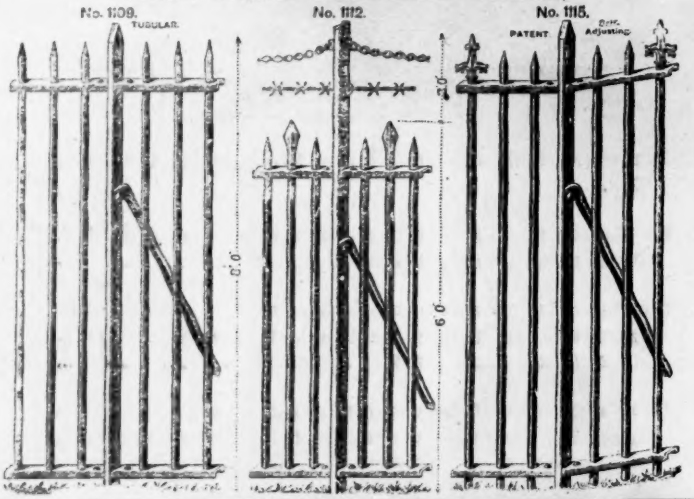

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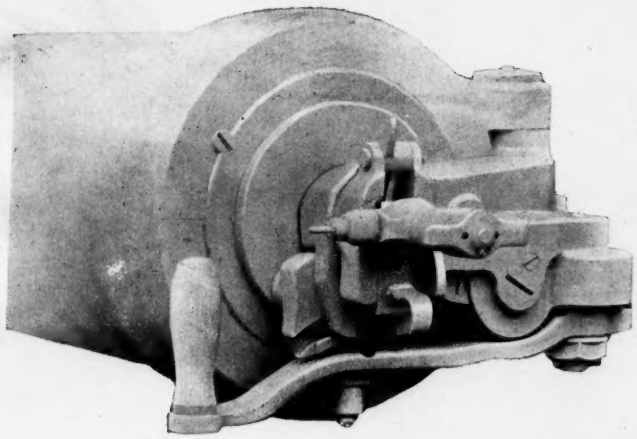

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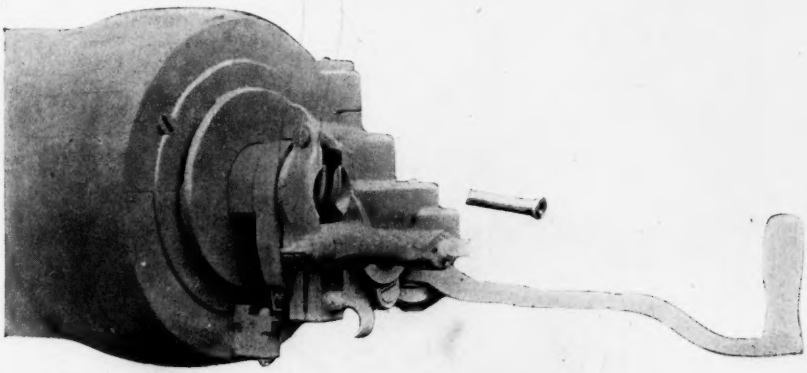

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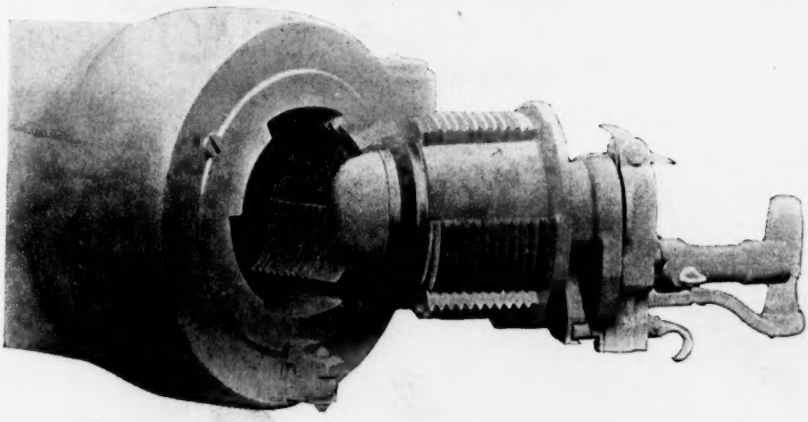

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THE BICYCLE FOR WAR PURPOSES.

By Captain B. F. S. BADEN-POWELL, Scots Guards.

Wednesday, March 15th, 1899.

Major-General H. H. D. STRACEY in the Chair.

PART I.

ITS USES IN WAR:—AT HOME—ABROAD—TACTICAL AND STRATEGICAL—AS A MEANS OF TRANSPORTING TROOPS—SCOUTING—ORDERLY—AS MOUNTED INFANTRY—TRANSPORT—CONVEYANCE OF WOUNDED—SPECIAL—ROADS.

TO begin with, I think it would be superfluous on my part to dilate on the advantages of the employment of bicycles in war. They may be briefly summarised by saying that such machines enable the soldier to be rapidly transported from place to place at a speed about three times greater than the ordinary marching and without utilising the expensive, forage-consuming, noisy, and comparatively delicate horse. The subject has been exhaustively treated of by Colonel Savile (in a lecture before this Institution in 1888) and by Colonel Balfour (in a chapter on "Employment of Cyclist Infantry" in Gall's "Tactics").

But since these articles were written great changes have been made in the construction of cycles, and the whole subject has been more carefully considered. Thanks to our Volunteers, much practical experience has been gained, and it now seems probable that we shall shortly actually introduce the bicycle as a regular and recognised addition to a modern Army. As regards foreign Armies, an excellent account of what has been done has been compiled by Lieutenant Whitney, of the U.S. Army, in the *Journal of the Military Service Institution*. At home we are about to take a definite step in this matter by the systematic training at Aldershot of sections of Regular troops. One subaltern, one sergeant, one corporal, and twenty-five men from each battalion will be taken in turns and trained under the supervision of Colonel Alderson, the officer commanding the mounted infantry. Altogether five companies are to be trained, the

course lasting six weeks. Just at present, too, the cycle construction seems to be narrowing down to one groove. Only a few years ago there were many different patterns of machine, but now that we have had experience of them all it seems that the time has come to decide on the exact pattern of machine most suitable for military purposes.

Considering the popularity of cycling, it seems curious that more has not recently been written on the subject of its adaptation for war, and as no one else more competent than myself seems inclined to bring it forward I have collected the notes for the following paper in hopes they may be of use and interest.

I had intended to confine my remarks to the details of construction only, but before that can be gone into at length it will be necessary to consider what qualities are required, that is to say, in what manner a machine is most likely to be used in war.

Now there are three principal circumstances under which British troops may be employed on service, each of which would seem to require a somewhat different type of machine :—

1. *At home, in case of invasion.*—Here, where roads are comparatively plentiful and good, and supplies usually obtainable in the thickly populated districts, the great object of the cyclist would probably be to dash about the country in the lightest order. A light machine might then do, as even repairing and replacing will not be so great a difficulty.

2. *Abroad, where the roads are good and plentiful,* yet where it may be necessary to carry provisions and supplies to last several days. This would involve more of a weight carrier and a stronger build.

3. *Abroad, where the roads are comparatively few and bad.*—There the whole action of cyclists would be much curtailed. Speed would probably have to be sacrificed to solidity. A specially *strong* machine would be necessary to stand the rough work, but it would be more unlikely that the cyclists would be despatched far distant from the main force, so that they would seldom have to carry supplies.

It is in the first of these categories, for home defence, that the cyclist would probably prove of the greatest value. Not only are the roads good and plentiful and well known, but our organisation for home defence is notably deficient in cavalry. But in an enclosed country like England the action of cavalry would be very greatly confined to scouting along roads, and for this particular purpose cyclists are undoubtedly superior to horsemen.

But to properly investigate the suitability of various types of machines we must further sub-divide the subject, and I suggest the following various ways in which cyclists may be employed :—

1. *Strategical, i.e.,* as a method of conveying rapidly comparatively large bodies of troops to the seat of war. They may thus rapidly concentrate on any point independent of railways, the machines being solely for use in the *strategical* sense for conveying troops to their destination, where the machines could be left stored, and the force act as ordinary infantry. Suppose, for instance, news was suddenly received that an invading force were threatening to land on our coasts—anywhere between the Thames and

the Isle of Wight, a battalion mounted on cycles could be despatched from London, and within 5 or 6 hours be on the scene, without waiting for trains to be prepared or other arrangements made, and leaving the railway quite free for the transport of stores and supplies, and other troops. Not only one battalion, but a dozen could be sent, utilising different by-roads which would have been well surveyed and considered beforehand.

This should be a *most* important factor in home defence. It might even be possible to have the greater part of the Volunteer Force so organised, since nowadays most men ride and possess bicycles, and occasional practice rides would be sufficient training. Troops could thus be brought to the theatre of war from all parts of the country by stages, marching their 40 or 50 miles a day.

And this, of course, not only applies to home defence in England, but, in many cases, to the defence of our great Colonies, and especially to operations in India.

It may be objected that such large bodies would involve enormously long columns. So they may; but, after all, they would not be so long as columns of cavalry.

Incidentally, while speaking of Volunteers as cyclists, I hear it said that many of our young men, and those most suited for Volunteers, prefer going for their bike ride on a Saturday afternoon to doing a bit of steady drill in the barrack square. The extension of Volunteer cyclists then might be a great incentive to Volunteering, and properly organised military tours would doubtless prove popular.

For this particular mode of employment, Volunteers would of course have to use their own machines, and no one special pattern could well be adopted. But for Regular troops it might be desirable to have stores of bicycles ready. Such machines, merely to be used as a mode of locomotion, enforce no very definite qualifications. They would be primarily for use on fairly good roads, not required for long or severe use, and need not be arranged for many of the purposes to which I shall presently refer. Cheapness, and compactness for storage, would then be the most sought-for qualities. It may also be desirable that such a machine should be a good baggage carrier, so that kits and provisions, and a good supply of ammunition could be carried. On the other hand, under such circumstances, stores of all kinds might be rapidly sent to the front by the otherwise unencumbered railways.

But such a mode of marching is applicable also to other forms of warfare than the defence of our shores. One is often apt to look upon war as a series of battles, and to forget that for every day of fighting there are perhaps twenty or thirty spent in marching quietly along the roads from place to place. Wherever roads are good and plentiful, large bodies of infantry on cycles could be beneficially employed. And indeed there are many countries where roads for wheeled traffic are unknown, yet where the native tracks are eminently suitable for cycling.

2. *Raiding.*—The next use of cyclists which we will consider is what may be included under the head of *raiding*. I am not exactly referring to that species of warfare as exemplified by certain recent

operations under Dr. Jameson, but I mean a rapid march into the enemy's country for some particular object, such for instance as the destruction of a railway bridge, the cutting of communications, or even the relief of a more or less hemmed-in force. In these cases, celerity is all-important, yet hard fighting may be expected at any moment.

For such a purpose, given good roads, cycles would be of the greatest use, since distances could be covered in a short time by this means, such as would be impossible even to horses. But it demands a really good machine. Every little breakdown would be fatal. Qualities for speed, weight-carrying, and strength are essential.

3. *Scouting and Reconnaissance.*—For these purposes also cyclists will be most valuable, especially when there is a deficiency of cavalry. As a rule, patrols would be sent out from camp to go a certain distance and return, so that but little weight need be carried on the machines, beyond the rifle and a small supply of ammunition. This may be either for watching the enemy or only for surveying the country. It would be especially useful for outposts.

Under this heading may also be included the advance and rear guards of a force on the march, for which cyclists are eminently suitable, being able to keep a long distance ahead of the force (or behind in retreating), yet able to rapidly send back word when the enemy is met or obstruction is to be cleared.

4. *As Mounted Infantry* to a force of all arms.—It has often been said that mounted infantry must not ape cavalry, and authorities on military cycling have generally decided that this is still more the case with cyclists, who, they say, possess *no shock action*. And, though this may generally be the case, still, given favourable open ground — such as smooth level grass—a force of cyclists, especially if they be armed with revolvers, might well ride rapidly down upon a force of broken and demoralised infantry, and on getting to close quarters drop their machines and charge home. Under this heading would of course be included their employment *as escorts or convoys* to cavalry, guns, or rapidly moving columns of supply. They would be most useful with the cavalry screen, supplying not only a readily available force of infantry, but save much time and work in keeping up communication with the main forces.

Great speed would not usually be called for, but the force must always be prepared to be away for some days and so carry supplies with them.

5. *As Orderlies and Messengers.*—This is the purpose to which cyclists have hitherto been most practically put. As such, the man would usually carry no impedimenta. He might even as a rule go unarmed. Rapidity is important here, and a very light machine would suffice. It is not only in and about camp that such would be most useful, but also, in a lesser sense perhaps, owing to the difficulties of cross-country riding, for carrying despatches and messages in the field.

6. *For Transport.*—Now here is a subject which does not seem to have been sufficiently considered. Given a thoroughly strong machine

and fair roads, the transport of supplies might be carried out on emergency by cyclists in a surprising manner.

Setting aside the possibility of utilising such machines as "carriers" or others specially made for transport, I will only refer to the ordinary bicycle, which I believe could on emergency form a novel and rather remarkable means of transport. Thus, for:—1. Collecting supplies from the country round: a most important duty when a large force remains stationary for some time. 2. Rapidly bringing up supplies of ammunition, intrenching tools, etc. 3. Bringing up supplies from the rear to a force moving forward without sufficient transport. 4. For a lightly equipped flying column.

Now, under such circumstances (except the last) we will presume that the force is encamped and not in danger of immediate attack from the enemy. The cyclists would leave most of their kit, arms, and ammunition behind with the force, and proceed at a rapid speed to the locality where they are to obtain their loads. It may be objected that a cycle can carry no great weight beyond its rider, but speaking from experience I know that an ordinary cyclist can carry at least 200 lbs. on his machine in addition to himself. This may sound a lot, of course, but we know how a bicycle will bear the weight of three men, one on the handle-bar and one on the step behind. It may not be desirable to constantly impose such a burden on a machine and bump it along bad roads; but I am now only referring to emergencies; moreover, it would not be desirable to maintain any very rapid pace, and on hills and bad bits of road it may be necessary to dismount. Still, it would probably be quite practicable to maintain a speed of say 5 or 6 miles an hour over a good many miles of average road, carrying at all events a hundredweight. And now look at what this implies. A G. S. wagon with four horses takes a load of 30 cwt., that is as much as thirty cyclists. A horse requires about ten times the weight of food that a man does, and is of no use except for transport, and requires men not only as drivers but also as escort. Therefore the four horses consume as much food as forty men. The wagon wears out the roads and is liable to block them if a breakdown occurs, and cyclists would make two or three journeys to and fro over the same road bringing up supplies in the same time that the wagons made one.

Under this head we may include the conveyance of wounded in an emergency. We have seen at the Military Tournament how a man can be carried on a stretcher between two bicycles, even if the poor patient did prefer to be left to die in peace rather than be conveyed by this precarious method.

7. *Special Purposes.*—There are certain other purposes to which bicycles may be applied. Thus, *signallers*, who now, when on the march, have to stand and despatch their messages and then run after their battalion to catch it up, would find bicycles most convenient. Military *telegraphists* have used cycles in America with most satisfactory results for carrying men to repair their wires.

For *topographers* bicycles are of course most useful. In marching with a column, frequent halts can be made to fill in the sketch or report, and the column rapidly caught up again. Side roads can also be examined ; while the machine itself forms a most useful instrument, as a cyclometer, clinometer, plane-table, etc., can be attached to the machine. *Cooks* and men to collect fuel, etc., being mounted could remain behind and clear up and leave camp long after the column had started, and passing it, may arrive at the new camping ground to get well prepared before the arrival of the force.

Having thus considered the different objects for which a cycle is suitable, we must briefly consider, before discussing the details of the machines, the *ground* over which we may want to operate.

Roads.—Of course, everything, from the cyclist's point of view, depends on roads, but there is one point to remember. As regards the use of cyclists over the line of communication, whether for orderly work, conveyance of troops, transport, etc., when the same road will be perpetually used, it would be comparatively easy to keep a track in good repair. In wild countries it would be much easier to make a narrow cycle track than to build a regular wide cart road. Such tracks could be rapidly cut through forests or over rocky mountains. Even a boarded track would not be difficult to lay in many places, such as over marshy ground. There is a vast difference between making a smooth track a foot or two wide, and a roadway to stand heavy traffic, say, 20 feet wide.

Tracks used by bare-footed natives are generally suitable for cycles—so long as the gradients are not too great, or roots numerous. The sharp stones and thorns that would puncture a pneumatic tyre would also puncture a native's foot, and would therefore not exist in much-frequented paths.

In snow too, so unfavourable as a rule for cycle riding, hard tracks can soon be formed.

But cyclists are not necessarily entirely confined to roads. Large tracts of open plains are frequently met with over which cycles could travel in any direction, and though perhaps such cross-country riding may not be rapid or pleasant for ordinary touring, yet with proper training military cyclists should be able to do a lot of cross-country work.

PART II.

THE BEST TYPE OF MACHINE:—GENERAL TYPE—"BANTAM" AND FRONT DRIVERS — FOLDING — TRIPARTITE — TANDEMS — MULTICYCLES—DETAILS OF CONSTRUCTION—TYRES—CHAINS AND GEARS—MUD GUARDS—MINOR ACCESSORIES—SADDLES—BRAKES — ARMAMENT AND EQUIPMENT—ARMS—MACHINE GUNS—KIT REQUIRED.

We will now consider the most suitable type of machine for general service.

The usual build of safety bicycles of to-day—and there is no very great variety—is the outcome of years of practical experience. It is the survival

of the fittest of a vast number of patterns and a multitude of eccentricities. We should therefore take this as our groundwork. There are, however, a few qualities which a military machine calls for, which are not of importance in the ordinary machine, and which it will therefore be necessary to add.

The first consideration of a military machine is that it must be thoroughly strong. A light machine cannot be expected to stand the roughing of a campaign. It is probable that this will necessarily involve *weight*, and it will not probably be possible to make it much lighter than 40 lbs. The new French machine (*not* the "Gérard") weighs 45 lbs.

It will of course be necessary that all parts should be interchangeable, so as to facilitate repairing. The parts usually plated should be dulled or blued so as not to glitter in the sun.

As for material, though steel is usually considered better than aluminium or bamboo, that great authority, Mr. J. K. Starley, is in favour of a metal that will not deteriorate by oxidation. He suggests aluminium if a method can be found of satisfactorily joining it, and phosphor-bronze for certain parts, such as the spokes.

As regards the general form, it would be best to have the two wheels of the same size, so that the tyres, etc., could be interchangeable.

It is a pity a bicycle does not float in water. Not only in swimming rivers would this be desirable, but the capsizing of a boatful of cycles would now be a serious matter. Its displacement should support about 20 lbs., and if all the tubing were bigger, it might be made to float. The tubing of a bicycle might easily be arranged to form a reservoir for water. The handle bars alone would hold just a pint, and if detachable, might almost take the place of the water-bottle. Oil, too, not only for lubrication, but for lamps, could be kept in some portion of the tubing.

There is one type of machine, however, still popular in some quarters, which is of different form to the ordinary pattern of safety. I refer to that known as the "Bantam." This possesses one great advantage of being only 4½ feet long instead of the usual 6 feet. This is not only of value as considerably shortening the length of a column of cyclists, but is also of value in storing the machines, and making the cycle more generally handy. Its weight, too, is less than other machines, it being of more compact build, while its neat gearing I will refer to later. On the other hand, the "Bantam" may not be as good for general riding purposes.

But, after all, it is possible to make a machine shorter without necessarily designing it after the model of the "Bantam." With smaller wheels and a shorter frame, a compact and stronger (or lighter) machine may be made. A small wheel is bound to be both lighter and stronger than a larger one in which the same sectional size of spokes, tyre, and rim is used. By making a lower frame, even if not so handy in turning, it will be possible to "toe" the ground and stop without dismounting.

We then come to a type much advocated in some quarters for war purposes, *i.e.*, the *folding* machine.

Colonel Pilleau, R.E., says:—"I think it is now accepted as a fundamental truth that a military cyclist must be mounted on a folding machine."

Captain Gérard, of the French Army, is, I suppose, the originator of such a machine, and having had a good deal of practical experience with it, pronounces very strongly in its favour. His machine certainly does not appeal to the eye of the practical cyclist. The fact of the rider being directly over the hind axle, a special feature of the "Gérard" patent, not only does not look well, but Lieut.-Colonel Douglas, R.A.M.C., who has ridden about 1,400 miles on one, tells me he has found frequent trouble with burst tyres and worn-out bearings from this cause. The single tube, too, joining the wheels has a decidedly weak look, although it seems to have stood plenty of rough work abroad. The weight is 32 lbs., and it takes 40 to 45 seconds to fold or unfold.

All the other folding machines I know of are made with a frame very similar to the usual one, but jointed with hinges in the upper and lower tubes. In the "Offord" machine these hinges are made in the ordinary frame tubes, and, when set up, a sleeve slides over each hinge. In the "Folder" the tubes are prolonged so as to overlap, and a vertical tube strengthens the frame. The "Belgica," of which a large number has been purchased by the Belgian Government, has a second backbone, all these tubes being hinged in the middle. In the "Alstrom" only handle bars and pedals are folded.

Folding machines seem to be in great favour among the authorities abroad. The report of the Austrian manœuvres of 1896 says, "The difficulties of the ground have, so to speak, disappeared in presence of the folding cycle." After the German manœuvres of 1897 it was said, speaking of the best pattern of war cycle, "It can hardly be doubted that a folding machine is preferable." Both in Spain and Russia a number of folding machines of the "Gérard" type have been under trial. In Italy, too, a cyclist company has been formed, of which half are on folding cycles.

The advantages claimed for a folding cycle are:—

1. That when a piece of rough ground has to be crossed it is desirable to be able to fold the machine and carry it bodily over the ground. This applies to heather and long grass, to rocky country, to marshes, and also to steep hills, up which it becomes very difficult to push a heavily burdened machine. Such advantage is specially noticeable when a cyclist detachment, in skirmishing up a hill, or over rough country, to clear it of the enemy, leaves the machines at the bottom, and then has to return down again to get its machines.

2. Compactness in storage especially for railway and steamer travelling. With the usual form of machine it becomes very difficult to stow away any large number without rendering them liable to damage.

Some objections have, however, been urged against such machines. It has been said that the occasions are few and far between when the ground is so bad that the machine cannot be wheeled, though I think such ideas must be gained from experience during peace-time and manœuvres when cross-country work is usually much restricted.

Also that on such occasions any machine *can* be carried on the shoulder, though not comfortably or in such a way that the rifle can be used. It is also urged that a man cannot carry the weight of a full kit and a bicycle as well. But even here it must be remembered that he only carries the bicycle for a comparatively short distance, and that on many occasions he would be in light order, having left his kit in camp. Again, it is urged that a considerable time would usually be wasted in strapping the machine on the man's back and undoing it again. So, far, however, these may be considered as negative objections, in that they point to a folding machine not being a necessity rather than to its being objectionable. The actual objections are that the makes of folding bicycle referred to are necessarily more or less heavy and complicated. If made light they must be weaker than an ordinary machine, and though a pound or two extra weight may not be of extreme importance, they all have several bolts and hinges and other complications which *may* get out of order, especially after weeks and months of jolting and rough wear, in getting sand and grit in and receiving bumps and knocks. Simplicity of construction is undoubtedly of great importance.

With these conditions before me I have sought to devise a machine which should be foldable and yet at the same time no heavier or no weaker than an ordinary machine and free from complications. I hit off the idea you see exemplified here, called the "Tripartite" (Plate 8, Fig S. 1, 2, 3) fitting. The machine is *detachable* rather than *foldable*. There is a sleeve in the head which retains in place the balls of the upper and lower bearings, and a wing-nut secures the head clamp which, on being loosened, allows of the handle bars and the steering post being withdrawn from the head. The machine is thus easily divisible into three separate parts, which may then be hooked together, when it occupies a space very little greater than the most compact folding machine. Indeed it possesses an advantage over a hinged folding machine in that the pieces can be arranged *flatter*. I have often taken this machine with me in a railway carriage and stowed it underneath the seat, which would be impossible with other folders.[1]

In this type the ordinary machine is taken (this one is a "Premier"), with its well-tried diamond frame intact, *nothing* is detracted from it, and only a very simple portion added, which does not add ¼ lb. to the weight. The frame is in no way weakened, and very little complicated—indeed, in some ways it may be said to simplify the ordinary arrangement, as should anything go wrong in the head, it is so much easier to take to pieces. It also has the great advantage of being adaptable to any existing machine and at a cost of only a few shillings, and may thus be suitable for Volunteers.

The operation of folding only takes about 10 seconds, and it can then be readily slung over the shoulder without necessitating any adjustment of straps. A man can thus jump off the machine, fold it, have it slung, and be on the march within 15 seconds. He might have crossed

[1] Many of the principal makers, such as the Premier, Rover, Rudge-Whitworth, Marriott, and others, are now applying this invention to their machines.

60 yards of the bad ground before a man with a "Gérard" would have had his machine properly fixed on his back. This method of *slinging* a heavy machine also enables a man to readily rest the weight of it on the ground at any moment, as for instance when he kneels to fire. But on the other hand, if it *should* be any advantage to have the machine properly fixed on the back, it *can* of course be done quite easily with this pattern. Moreover, if it should be considered desirable for the man to have his kit on his back there is no room for a bicycle; but with the "Tripartite" arrangement he can hook it over one shoulder.

There are certain additional advantages in a separable machine. Thus (presuming they were all of one pattern), if three machines became damaged from bullets or other causes, each in a different portion, within a few seconds they could be taken to pieces, and two complete machines be built up. This might be of the greatest importance in action. Then again it would often be of advantage in lifting over walls, etc., to have the weight of a machine divided into three packages. And such an arrangement lends itself to various other devices, such as forming the framework of a pontoon boat or the support to a shelter tent. I will leave it to others more competent than myself to dilate during the discussion on the objections to this form of machine.

There is one other kind of cycle that I must refer to. *Tandems* and *Multicycles* have been tried for military work, and possess the advantages, as compared to a single machine, of being:—1. Lighter in weight per man carried. 2. Slightly quicker. 3. Take up less room in column of route.

They may also prove of use for carrying machine guns, tools, telegraph poles, etc.

On the other hand, the single machine is much handier and easy to stow, and if it breaks down only one man is dismounted, who may get a lift on another machine.

There are however many circumstances under which it might be most desirable for a machine to carry two men, such as the instance just mentioned, or even when a small party of ordinary infantry could be carried by cyclists and rapidly pushed forward or brought back in retreat. At a pinch a man can always be carried sitting on the handle bars. I have myself been thus taken on an ordinary machine for a mile and a half over a hilly and by no means good road. Mr. Starley suggests a couple of folding steps being attached to the hind axle, on which a man could stand.

As regards other qualities desirable in a military bicycle, I think the first consideration should always be *simplicity*. This would generally imply reduced weight, easier to clean, not so liable to damage or to get out of order. Therefore I should do away, as far as possible, with all accessories such as mud-guards, gear cases, foot rests, etc.

Tyres.—As boots have been said to be the most important part of a soldier's equipment, so we may speak of the tyre as regards a military cycle. But if I were to attempt to describe and discuss the relative merits of all the tyres on the market, I am afraid I should have to keep you here

till to-morrow; and as there may be some here who are interested in one or another, I don't know how long the discussion might go on. But I will say one thing. Notwithstanding what advertisements may say, I believe that *all* pneumatic tyres are not only liable to puncture, but also to a certain amount of leakage. The soldier on service cannot always be dependent on his pump; and, be it remembered, it is not only through accident as with the usual rider, that punctures will occur. On service, were pneumatics used, the enemy would without doubt try various means to wound so vulnerable a point, by scattering on the roads not only tacks, broken glass, etc., but even specially constructed obstacles of the nature of "crow's feet." It seems, then, an important matter for consideration whether solid or cushion tyres must not be adopted, notwithstanding their lack of speed and discomfort; and, after all, the old records show that solid-tyred machines were capable of making very fair speeds, the 50-mile record having been accomplished at a rate of no less than 19 miles an hour. There are also several new kinds of solid tyre which may be great improvements on the old. Among them are the "Idris," which has received great praise from some who have tried it.

In the French "Gérard" machines, Michelin's cellular pneumatic tyre is used, which has, I believe, two air tubes, so that when one becomes punctured the other can be blown out.

Mud guards are an addition which I think quite superfluous. They are all very well at home when it is important to keep the uniforms clean, but on service to have to carry about an extra weight of 2 lbs., with considerable complication, and great addition to the difficulty of cleaning, is of course absurd. A bullet striking a metal mud-guard, a collision, or any other slight mishap, may knock the thing sideways, or gouge a jagged splinter from it sufficient to prevent the wheel rotating freely just at a critical moment. If the machine is fitted with a valise behind the saddle, this would form quite sufficient protection from mud, and in peace-time a light canvas arrangement can easily be applied. There is only one point where a mud-guard is really required, and yet, I don't know why, it is seldom, if ever, applied there. I refer to a machine without a gear case. The mud from the back wheel continually spatters right into the chain with palpably detrimental results, yet a very small shield applied in the right place would prevent this.

Chains and Gears.—Chains, however efficient from the theoretical point, are a great source of trouble. Gear cases are objectionable for reasons already mentioned, and also prevent the chain being looked to quickly if anything does go wrong. Without the cases, however, chains are apt to get clogged with mud or dust, and are then apt to get tight and even break. Chains are difficult to clean and keep in good order.

A simple band or ribbon of steel, etc., overcomes some of the above objections; but though often tried, none seems to have proved a success on cycles.

As regards *Chainless* gears, there are several going which appear to answer satisfactorily.

1. The *Crypto* gear, in which the pedal cranks are on the axle of the wheel. This is a simple and efficient gear, but is of course only applicable to a front driver, such as the "Bantam."

2. The *Acatene*, or bevel wheel, seems to have stood the practical test of many years' wear. It has the great advantage of being compact and well protected, both from dirt and damage.

3. Lloyd's *Cross-roller* possesses the same qualities, and has also given much satisfaction.

4. The *Cam* gear, on the other hand, is not so compact and neat-looking as the former, indeed, has few advantages over the chain.

Saddles.—I never could find any two people agree as to the best form of saddle. I believe all kinds can be got accustomed to after a few rides, but that all are equally uncomfortable after three or four hours' steady riding. One would become tired of sitting in one fixed position in the softest arm-chair after that time.

Brakes exist in very many forms. Here again simplicity and strength are important, and it has to be remembered that a heavily encumbered military machine requires a powerful brake on an unknown declivity, and that back pedalling under the circumstances is somewhat irksome.

Gear Cases have already been referred to. If really considered necessary, the simplest form should be adopted and metal avoided, since it is more liable to suffer from knocks and dents and bullet wounds. It is essential that it should be easily detachable.

Lamps.—There is a question as to the extent to which lamps will be required. Under the various headings I have put down they would hardly be required, except for *night* marches, which would seldom be made except for the purpose of secretly approaching the enemy, when all lights should be prohibited, and for *orderly* work, when they might be desirable, but this would only apply to a comparatively few machines. Otherwise the lamps would only add to complication, require frequent replenishing and would generally be useless and in the way. It would probably be preferable when required, to affix them to the machine very low (on axle of front wheel), so as not to be seen so easily from a distance.

Luggage Carriers fixed on the handle bars or head or behind the saddle would be necessary, not only for carrying kits, but also other articles.

Rifle Clips.—It is of course of the greatest importance to be able to very quickly detach the rifle for use. There are several different methods which have been tried. A very neat clip for holding the rifle has recently been brought out. The rifle is placed between the jaws of the clip (which is merely fixed to the frame) in an upright position, and then turning the rifle so as to lay horizontally the jaws automatically close and grip the rifle firmly. I also show a still simpler clip.

A *support* to keep the bicycle upright would be a convenience under many circumstances, so long as it was simple and light.

A *coupling* to connect two bicycles together has been invented by Lord Dundonald, and should prove most useful for all transport work.

A *cyclometer* of simple form, such as the Veeder, does not add much to the weight or complication, yet would be most useful for purposes of reconnaissance. Possibly officers only need carry them, but it would be preferable for *all* reconnoitrers to have them so that they would be absolutely accurate in their reports. Thus a scout coming back to report might say he came across the outposts about two miles along the road; but such a distance is difficult to judge, and his report might be of much greater value if he could say it was exactly one mile and three-quarters off. Of course, distances *can* be measured by counting the revolutions of the pedal, but the cyclometer would be more efficient.

A *watch* is another instrument which would be most useful to a cyclist scout, especially if he had no cyclometer.

It may be as well for me to add a word or two with regard to the armament and equipment of the cyclist.

Arms.—There are many good authorities who consider the long rifle an indispensable weapon for the efficient infantryman, but there are also some who are not so enthusiastic about it. Thus Colonel Lockyer, R.A., Chief Inspector of Small-Arms, speaking in this Institution last year, of a universal pattern of firearm for all services, said, "The weapon I am strongly in favour of is a carbine," and then proceeded to point out that as compared to the long rifle the present pattern of carbine gives only slightly less muzzle velocity, about the same accuracy, even at long ranges (1,400 yards), weighs nearly 2 lbs. less, is 8 inches shorter, and therefore more handy, and is easier to clean. It takes the same ammunition as the rifle. I cannot therefore see where the advantage of the extra weight and length comes in.

The French cyclists are armed with the cavalry carbine. So are the Italians.

But for light scouting service, as well as for orderly work, a long-range rifle is perhaps unnecessary. The scout is to see, and not to fight, but he requires a firearm for two purposes:—1. To make a feint and cause alarm, then accuracy of fire is of little importance. 2. To protect himself if suddenly waylaid or attacked by a small party of the enemy. For both these purposes a pistol is as good as anything, indeed for the latter it is the only weapon. A cyclist going along a road and finding his way barred by two or three of the enemy would be at their mercy had he nothing to rely on but a rifle, which he would have to dismount to use, but with a handy revolver or other pistol he can keep going straight ahead and pot his opponents at close quarters. A few cyclists might even, under favourable circumstances, make a regular charge. A Mauser magazine pistol or, better, carbine might come in well here, although, as pointed out by the above-mentioned authority, it is somewhat complicated and has too light a bullet to have much stopping power. I find it, however, very easy to take to pieces, so that any part could be rapidly replaced. As for range the service Webley (·44 bore) has actually sent a heavier

bullet to the extraordinary distance of 1,578 yards! The Austrian cyclists were only armed with the revolver during manœuvres. The weapon must be capable of being used with one hand only.

A light *machine* gun would of course be most useful to a party of cyclists. Mr. Maxim has one now which weighs only 25 lbs., and could easily be carried on a bicycle if others carried the ammunition.

As regards officers, there is one weapon which I unhesitatingly should condemn, and that is the sword. If attached to the cycle, and if not a folding machine, it would generally be left behind when coming to close quarters. If worn on the belt it would generally get through the spokes of the wheels. I think most practical soldiers will agree that, as far as an infantry officer goes, it is an obsolete weapon; simplicity is its only virtue; but as it generally seems to break directly it is really tried, personally, I should always prefer to have two pistols. I say two, in case of one going wrong, as, unfortunately, revolvers are apt to do. A really simple repeating pistol is much needed.

Dress and Equipment of the Cyclist.—Though a big head-dress catches the wind, a belt is uncomfortable when leaning forward, and ammunition boots are not suited to pedals, otherwise there seems no reason why a cyclist should not be dressed as any other soldier; except for the reason that nowadays all smart and artistic effect seems to be discarded as much as possible. Breeches and stockings are all very well, but one can picture the cyclist who, after two or three months of campaigning, has worn them out and gladly adopted a pair of grey socks out of store, and cut short a pair of "tartan" trousers.

Then boots or several pairs of strong shoes *must* be taken. A machine is always liable to break down, and the man may have some long marches to perform on foot. The French carry two pairs of shoes on the machine.

A good deal might be said as to which articles of equipment should be attached to the man and which to the cycle. For comfort (which is nearly synonymous with efficiency), the less the man has on himself the better. But yet, as he may have to fight away from his machine, he should have a good supply of ammunition on him. As he may have at any moment to change machines with another man, he *ought*, also, to keep his own personal articles on himself. But of course much will depend on the particular service in which he is to be employed. As a machine may at any moment have to be abandoned, it is essential that the kit carried on it should be readily detachable.

I think everyone is more or less in agreement as to the efficiency of a bicycle for employment in war, but it is most necessary to bear in mind that that efficiency is dependent on the exact form of machine used, and if we are not careful to select a suitable build, formed of the most suitable materials, and fitted with most suitable accessories, we may discover, too late, that the efficiency was not so great as we had expected.

Before closing, I should like to add a word of thanks to Colonel Savile, to Major Liles (of the Cyclist Volunteers), to Captain

Swindley (also of the Cyclists'), and to many other authorities, who have been so kind as to give me valuable assistance in the compilation of this paper.

Major W. ANSTRUTHER-THOMSON (Royal Horse Guards): – There are one or two small points I should like to mention. I happened to be at the French manœuvres last September. There were two army corps there and two cavalry divisions, and Captain Gérard was there with his cyclist corps, and he did a lot of very good work. It surprised me to see how he was able to keep up with cavalry and to come both in aid of cavalry and against cavalry. I had hitherto thought that the bicycle could not hold its own with cavalry in any way whatever, but certainly in France at those manœuvres I found that in many cases I was wrong. The Gérard cycle is a folding cycle, and the men are able to fold and sling it in about three-quarters of a minute and carry it away on their shoulders (they did not carry a pack). They could thus go across country and over fences; in fact, they could go anywhere—and they came in, on several occasions, in the most remarkable manner. I do not for a moment hold that the cycle can ever take the place of cavalry or mounted infantry. I think it is a great mistake to compare them in that light. But I do think that the three forces –cavalry, mounted infantry, and cyclists—are most valuable auxiliaries to each other; and if we run on those lines we shall do very good work. I should like to quote a French newspaper, the *Revue de Cercle Militaire*, as follows: –"Cycles have conclusively established their military value; and cavalry, which originally looked down on the wheelmen, are now their best friends, it being found that the two forces are the complement of each other." That is the gist of the whole question, to my mind, as far as regards cavalry and mounted infantry. From my own experience as a squadron commander, I have found cycles of the greatest use. General Luck allowed us to use cycles on reconnaissance if we could get them (we had of course to provide the cycles ourselves)—I always had as many as I could get, generally three or four—and I found them most useful, saving both time and horseflesh. Captain Gérard, I may mention, at the French manœuvres was not mounted on a cycle, but rode a cob, and did a lot of reconnoitring for his little force; he recognised the fact that to get the full value of cyclists, scouts on horseback are essential, just as they are with machine guns. I am convinced that the cyclists owed much of their success to Captain Gérard's wisdom in riding a cob instead of a cycle. It often occurred that the horse could gallop over ground which checked the cycle, and sometimes positions could be selected and ground reconnoitred before the cyclist scouts carrying their cycles could possibly get there. This saved time, and time wins battles. A few horsemen attached to a cycle corps should prove as useful to them as cycles are to cavalry, only of course in a different way. There is one point upon which I differ from the lecturer, and that is where he speaks of shock action. I do not think that really shock action comes into the question of cyclists at all. Nor do I think that a revolver fired by a cyclist in motion would do much execution to the enemy, and I do not think that a scout armed with a revolver would have that confidence which is necessary to push his way into an enemy's country. What you want in your scout is confidence, and I think he would do far better with a carbine. By all means give him a revolver as well, if you like; but, personally, I do not look on a cyclist armed with a revolver alone as a very terrible antagonist. Cavalry would not be stopped by revolvers fired by cyclists. The French wear, as you probably know, puttees, instead of gaiters and shoes. These puttees seemed to be very serviceable, and did not appear to hamper them in any way. The men were armed with cavalry carbines and short bayonets. They carried the carbines slung over their shoulders as the cavalry do in France, and when marching with the cycle on their backs they carry the carbine at the trail. Their baggage was carried by a cavalry wagon with the cavalry baggage. That is an important point. If you are going to carry your cycle on your back, you cannot carry a knapsack

there as well. The Austrians are experimenting with automobiles, and I believe the reports are very favourable. They hope to do a lot of their transport work now with these motor cars, and the French, I fancy, are going to follow suit. They might possibly be used where good roads prevail to carry the cyclists' baggage. Machine guns on cycles have vast possibilities if you can only carry enough ammunition. There is no reason why you should not do wonders with the machine-gun on a couple of cycles fitted with either Lord Dundonald's coupling or some other. I should like to ask whether the 25-lb. Maxim includes a tripod. To sum up, I think that military cyclists, worked as Captain Gérard worked them, would be of the greatest service in war; but if you arm your men with a revolver only, and mount him on a cycle that cannot fold up or be carried across country and over fences, you rob him of half his value.[1]

Colonel A. R. SAVILE (late Royal Irish Regiment):—Although, Sir, as you know, I am not now actively connected with military cycling, I am very pleased to be able to say a few words about it to-day, even if it be only to congratulate Captain Baden-Powell on the excellent lecture he has given us, and to congratulate ourselves on having heard it. I am afraid I am hardly up-to-date now on military cycling. It particularly interests me to hear what new things have been done since I resigned my commission in the Cyclist Corps. I am also interested to hear the list of objects for which cyclists might be employed, and to learn whether any new ones have been invented since we began about twelve years ago. I think most of them appear to be very much the same, and that, of course, is distinctly pleasing to all of us who had a share in the work at the commencement. I take it that if they are now included in the list, cyclists have shown that they can do them, and do them efficiently. There is one new one, No. 6. I think Captain Baden-Powell is a very bold man to come before an assembly of cyclists and suggest they should be used as transport animals. I do not know whether it is a mode of employment which would be popular or would attract many recruits. As our chief characteristic is speed, it does seem hard to make us baggage carriers. I was very much pleased and rather amused to see amongst the list of duties one I suggested myself long ago—namely, escorting artillery. Some of you may perhaps remember how exceedingly heavily I was jumped upon at the time by a critic, who said it was a perfectly ludicrous thing to suggest that cyclists should escort artillery. I think the laugh is more on my side now, because in the Cavalry Drill-Book it distinctly says that mounted infantry are to be used to escort horse artillery. Possibly it may be argued that that does not apply to cyclists, but only refers to infantry mounted on horses. But we have the opinion of the Commander-in-Chief that you cannot dissociate cyclists from mounted infantry, and I fully agree with him. Then, with regard to the folding bicycle, I have never personally favoured it, and the chief things I wished to hear to-day were the arguments in favour of it. I think Captain Baden-Powell has made out an excellent case in favour of the folding bicycle, so far as a case can be made out. We shall probably hear this afternoon the opinion of officers who are practically engaged in military cycling, who will tell us whether they have found the folding bicycle of use on certain occasions, and if so, on what occasions. I do not think I have ever been across country with military cyclists when to have folded the bicycles and put them on our backs would have got us on faster or easier. The bicycle has got to carry the man, not the man the bicycle. I really think that over grass, stubble, or anything like that, one would ride the bicycle as

[1] So useful were Captain Gérard's cyclists found at the French manœuvres, that several of the generals formed their cyclist messengers into sections, and placing them under officers on cycles used them in the same way as Captain Gérard's corps. It was thus possible to compare the work done by troops mounted on the ordinary cycle which had to follow the roads, with those on the folding cycle that could be taken across country. I don't think that anyone who has seen the two together would hesitate in declaring for the folding cycle. The entire mobility proved invaluable.—W. A.-T.

has been pointed out; but on rough ground I think pushing it would be better than carrying it. I cannot conceive any hill so steep that one would rather carry a bicycle up than wheel it. It often helps a man to stand by his bicycle and lean on it, and the steeper the hill the more disinclined I should be to carry the machine. As regards the special machine, my opinion is, that any really good bicycle is fit for military purposes. I do not see that very great weight is required. It is one of the chief features of modern cycle construction that very great strength can be obtained without great weight. Weight and strength at the present time are not synonymous in cycle construction. You can have a fairly light bicycle, and yet one strong enough for military purposes. It is very pleasant for everyone connected with military cycling to know that the movement is progressing, that there are more military cyclists every year, and that it is getting more popular. The last figures I have show a strength of 3,411. That, I think, is very satisfactory, particularly when we consider that the men are well equipped, well trained, good shots, and efficient cyclists. The figure I quote is an old one, dating from October 31st, 1897. The Volunteer returns for last year, I think, are not yet out. I should have liked any lecture on military cycling to include a suggestion to the authorities to give more support to the Volunteers—to help them a little with the expense of providing machines. I believe the Yeomanry soldier receives something for his horse, or at any rate that his horse is fed for him when he is out. The Volunteer cyclist might be allowed oil for his machine at the rate of a shilling a day whenever he is on military duty. Major Liles and others will probably tell us what a tax it is on the men of the corps to keep their machines in military order and ready to turn out. Manœuvres take a good deal of value out of bicycles, and I think a portion of the expense ought to be borne by the country.

Lieut.-Colonel E. GUNTER (late East Lancashire Regiment):—I think, Sir, we are very much indebted to the lecturer for the very able lecture he has given to us, and for showing us that most ingeniously contrived detachable bicycle. I think any military bicycle must be a portable one. Personally, I have a very painful recollection during the late manœuvres at Salisbury of pushing my bicycle up the steep hillsides there, and, notwithstanding what the last speaker has said, I think I would rather have had some kind of portable bicycle. We have not, I suppose, time to go into the details of the lecturer's contrivance, but I have no doubt it offers a great many advantages. However, the fact of the portable bicycle being adopted in France and Germany speaks for itself. I should like to ask the lecturer whether, in addition to those he mentioned, he knows the "Styria" bicycle, which is used in Austria, and the "Adler" portable bicycle, made by the "Adler" Company, a well-known bicycle factory in Frankfort. I have seen it myself, and it is a very strong machine, jointed with a simple bolt. Its weight, I think, is not very great, about 32 or 33 lbs. As Colonel Savile said, we need not, I think, have such very heavy machines as the lecturer mentioned. We might get one of from 30 to 35 lbs. weight, which would answer all our requirements. The lecturer said that a battalion of cyclists could be despatched very rapidly in case of invasion, and that it would take only five or six hours to reach the coast. I think that with the experience our staff has had in sending down troops, they would be more likely to send them down by rail in two and a half hours. Of course a large number of cyclists might be sent on emergency—for instance, if the railway were destroyed. A rapid raid on a railway might destroy it, even though there was not much time to break up the roads, and then to send the troops on cycles would be useful. But, as regards a dozen battalions, where are they to be got? I am, of course, speaking of the Line, and not of the admirable Volunteer Cyclist Corps which we have. There are not many Line troops who are able to ride cycles, and I venture to suggest it would be an excellent thing if every infantry battalion was allowed to have three cycles in each company. They would be useful for all kinds of things in camps, as messengers, etc., and with the aid of these three cycles a section of twenty-four

men in each infantry battalion might be formed, and by means of those cycles by degrees almost the whole of the men might be trained regimentally to ride cycles; thus on emergency they would be of great use. I quite agree that the cycle might be of value for transport purposes, and I dare say the lecturer knows as well as I do that something of the kind was designed before the days of cycles by the late Colonel Heyland. He designed a most ingenious carrier, the details of which will be found in the library of this Institution. It was used practically and spoken very highly of in India, and I have no doubt something of the kind might be adopted. With regard to tyres, of course that is most important. I do not think myself that you can do with the pneumatic tyre. I think you must have a solid tyre for military purposes, because the pneumatic tyre, as has been said, is so liable to puncture, and could be easily cut and damaged by cavalry. Solid tyres are not so heavy as they used to be, and, as the lecturer pointed out, they have been improved. With regard to the armament, the point has been brought out very well by the officer who spoke first in the discussion. I think the weapon should be a carbine, and that we should not rely on the revolver; a carbine would give the men much more confidence. The difficulty of getting across broken ground has been alluded to as the reason for adopting portable cycles, but I think there are many instances where portable cycles would be almost a necessity. Take the case of cavalry suddenly charging down on a road with high banks. Notwithstanding the long time that it has been said is necessary to pack the machine, there is no doubt well-constructed portable machines could rapidly be put on the men's shoulders, and they could climb up the banks with them, where the cavalry could not easily get at them. It is all very well to say cyclists can always resist cavalry; but if they had pneumatic tyres, at all events the tyres could be easily slashed or punctured with swords or lances. Cyclists can hardly hold their own unless they can take advantage of broken ground—it depends upon the ground a good deal; but on the whole, I think, portable cycles will be found to be the best for military work.

The CHAIRMAN (Major-General H. H. D. Stracey):—I do not know, Colonel Savile, whether you would like to add to the interesting remarks you have made by giving us the benefit of your advice on the most desirable tyres to use—on the general principle of whether solid or pneumatic tyres should be used.

Colonel A R. SAVILE (late Royal Irish Regiment):—I am afraid, Sir, I am not in a position to do that. Whenever people speak about tyres they always say they are not interested in them. The one tyre which I think is not a bad one for military purposes is the one I am distinctly interested in; and that is the reason, Sir, I hardly like to name it, if you will excuse me.

Major C. E. LILES (Commandant Volunteer Cyclist Corps):—I should, Sir, like to support Colonel Savile's remarks complimenting Captain Baden-Powell on the excellent paper he has read this afternoon. It has been the most comprehensive paper I have yet met in connection with military cycling, and I think all here are very much indebted to him for the trouble he has taken to prepare it. I have seen a good many different types of folding cycles, but I do not know whether I have met those which Colonel Gunter mentioned. As we have already heard, there are several objections to folding cycles. They are likely to get out of order, and if you are going to use portable cycles, from all the machines I have seen there are none so near perfection as Captain Baden-Powell's invention. His cycle is quite simple, it adds nothing to the weight, and it fulfils every requisite that I can suggest or think of. Colonel Savile made some remark about never finding a place where a portable cycle would be of any use. I agree with him to a certain extent, but I have seen some places I should not like to push a machine up myself. I have reminiscences of sundry Scotch moors where pushing a machine would be out of the question. If it had been a portable one I should also have left it at the foot of the hill and gone on, trusting at some future time to find it again. I

consider that a country where cycles are of no use at all and where you would not employ them, and you would use mounted infantry or cavalry for any work that had to be done in such a country. As far as my limited experience goes of manœuvres in the South of England, I have not yet come across a place where portable cycles would be a necessity. Colonel Gunter mentioned one possibility—I have had experience of it—a road where high banks and hedges exist. On such a road the cavalry when attacking would have to come up in solid formation with a very small front, and they would not be able to face the rifle fire. In a road with high banks you could only bring up cavalry ten or twelve abreast, and a few horses going down would check those behind them. As far as the armament goes, I think with several of the speakers that the carbine would be better than the long rifle. I am taking it from Colonel Lockyer's remarks that the efficacy of the carbine up to 1,400 yards is practically the same as the rifle, and I do not think, at all events at the present time, we are likely to want to do much shooting beyond that range. The carbine would certainly be much easier to handle and less weighty to carry. There are two little details on which I rather join issue with the lecturer. First of all, I am not a supporter of his idea of shock action. I think that is rather remote. Another thing that I do look upon is that on a machine for rough wear a gear case is a necessity. I remember a competition held at Blackwater some three or four years ago, over a sandy road on a wet day. The only team able to finish in anything like decent time was one with machines fitted with gear cases. All the other machines came to grief through having naked chains; the chains got full of grit and snapped. I should not like to say off-hand how many broken chains there were, but I should say there were over twenty on that day.

The CHAIRMAN :—I remember it.

Major LILES :—I think you were there, Sir. Team after team came in reporting that they had given up, owing to chains breaking. I think that was the greatest object-lesson in favour of gear cases I have ever seen. A gear case need not be heavy. You do not want metal gear cases, as long as you keep the grit and sand off the chains. I have found from experience that a leather gear case answers all the purposes, and I have used leather ones for five or six years, and during that time I have ridden something like 20,000 miles. Therefore, I am speaking from a fair amount of experience. With regard to tyres, I quite think there should be some form of cushion tyre. The solid tyre is too heavy, but there might be some kind of cushion tyre which would be useful. There have been various kinds put on the market, but I do not wish to refer to any by name as it is putting too much of a premium on advertisement. Like Colonel Savile, I am rather diffident about mentioning any tyre by name. I remember that once I did make a remark that I thought a certain tyre would be of use, and I had the pleasure of seeing my opinion handed round on handbills at the Stanley Show. I do not think there is any other point I need refer to, except with regard to a grant from Government for military cyclists. As far as the Volunteers are concerned we do not get any increased grant for the wear and tear of cycles. The battalions have to do what they can for the men in that way. In fact, I make it a rule in my corps, that the battalion pays for all damage that occurs during manœuvres or drills, provided the machines are satisfactory and are passed by a Board consisting of one officer, one non-commissioned officer, and a competent repairer. The two conditions I make is that the machines shall be fitted with an efficient brake and with mud-guards. Mud-guards on active service, I agree, would be of no use at all. They are only in the way and add weight, and more or less give trouble; but for peace work, where one wants one's uniform to look decent, a pretty good mud-guard is a necessity. The valise will hardly serve the purpose of keeping the mud off. I should very much like to see a grant made by the authorities for cyclists. It would enable the officers commanding corps to exact that all machines should be of one particular

pattern. As they can offer no inducement for men to do that, you can hardly expect them to be so patriotic as to get machines which would be suitable for military purposes, but hardly so light or fast as they would like for their private requirements. In conclusion, I thank Captain Baden-Powell for his most interesting lecture.

Major B. St. J. BARTER (Lincolnshire Regiment) :—After the very interesting and exhaustive lecture which Captain Baden-Powell has given, there is very little left to be said, but I just want to give my experience on one occasion when I was engaged in a cycling reconnaissance. It was in the neighbourhood of Woolwich, and about thirty officers of the garrison, who volunteered, reconnoitred about 200 square miles of country, a sector comprised within the boundaries of the Thames, the Medway, and the London and Brighton line. We started about ten in the morning, and all the reports were rendered at headquarters about six in the evening, and the whole of that country had been thoroughly reconnoitred in the time. I think it could not probably have been done as thoroughly, or as fast, by cavalry. On another day we had a ride of officers, non-commissioned officers, and men of the garrison, who volunteered just simply for experimental purposes, to find out at what pace we could ride in formation for a couple of hours. Of course we were lightly equipped, in fact no arms, or ammunition, or kits were carried, and we covered about 20 miles in the two hours. It therefore evidently does not require very much training. The formations were well kept, and the distances also were well preserved. I may mention that the reconnaissance work at the Staff College is very much done nowadays on bicycles, and an officer is able to do infinitely more work now on his bicycle than he ever did before. He is able to go over all sorts of ground. I have done a good deal of work of that sort myself, and I agree with Colonel Savile in that respect, that I have never yet come across ground where I could not wheel my bicycle. Over most ground I could ride it. I think that the carbine is the proper arm to give bicyclists. The long rifle is a little inconvenient and not very handy, and you want something with which you can take a better aim than the pistol or revolver. Cyclist infantry, as the lecturer said, should be merely infantry carried on cycles, and I think shock action does not come into play at all. The question of the gear case is a very important one, and I certainly think that a gear case should be upon a bicycle. It is the crux of the whole thing. If you get your chain either muddy or very dusty the bicycle will not run smoothly and the chain is apt to snap. I am sure we are all exceedingly grateful to Captain Baden-Powell for his excellent lecture.

Major C. J. FOX (3rd Bn. Middlesex Regiment) :—We must all feel very much indebted to Captain Baden-Powell for his excellent lecture. I should have hesitated to obtrude my opinions on the meeting except for the fact that I was instrumental in raising the first force of military cyclists, and being present I think it well to say a few words, because anyone having any sort of knowledge on a question like this should, for the public benefit, state what he feels and knows. First of all, one point which struck me was the very small number of Volunteer cyclists mentioned by Colonel Savile. At the present time there are only some 3,000; there ought to be 30,000, and might be. As I urged on the authorities some years before you, Sir, took the initiative, the cyclists should be got at through their cycles, and not by means of Volunteering. With regard to the shock action suggested, anyone who knows anything much about cycling on the road, or meeting with cavalry or infantry, will see that that could not possibly be of any use. Not once in a thousand times could it avail the cyclist infantry anything at all, and it would always lead to disaster. It is most important that there should be means of readily disabling cycles, because if they are simply to carry infantry (and I hold that is their proper function), if they have to be abandoned and fall into the enemy's hand, they will possibly get into the hands of other cyclists in the ranks of the foe, and could be made use of against us; whereas a small readily released handle-bar or saddle-pillar would render them quite useless, and when they were

recovered they would be again available. With regard to horses facing cyclists, we had during the manœuvres, of which you, Sir, had command an instance of what might be expected. Horses will not, unless they are accustomed to it, face cyclists. A few cyclists can block a road with their machines and make it, for a time at all events, impassable to cavalry, and meanwhile the cyclists can line the road and bring about a great disaster, by throwing the enemy's cavalry into disorder. I am sorry to differ from the lecturer, but really as an old cyclist, a present cyclist, and one taking a very great interest in cycling, I should be very sorry to see the cyclist infantry man converted into a sort of Christmas-tree. It is bad enough to see the average infantryman to-day, who is sufficiently hampered with impedimenta. I think you would dishearten the men and lower the prestige of the cyclist infantry generally if the men were made into baggage carriers. I think they should be treated entirely as light infantry, and in that way they could invariably be made of very great service to any general officer wishing to employ a force at some distance, with a view to securing a position. With regard to the officer's sword, I quite agree with the lecturer that the infantry sword on the bicycle is not required. If any weapon of that kind is to be taken, a good naval cutlass is about the best thing, and that won't fail you. I was very glad to hear Major Anstruther-Thomson say that it was very undesirable indeed that cyclist infantry should be compared with cavalry. Their functions are entirely different, and nothing has done more to retard the cyclist movement than the early jealousy of the cavalry towards the cyclists, who are, and always must be, mounted infantry. In the old days, in fact, it was considered discreditable to be a military cyclist at all or to have anything to do with it. With regard to the folding bicycle, I am sorry to say as an experienced cyclist that I quite disapprove of folding machines or military purposes. It may do very well for the purposes of drill to put a bicycle together in ten or fifteen seconds, but it will not be so easy under fire; and besides that, you have a double surface of tyre, if you are using the pneumatic tyre, presented to the enemy's bullets instead of a single surface. I certainly agree with Major Liles that if you are to have a folding bicycle the type shown by Captain Baden-Powell is the best we have yet seen. The only thing I would suggest is that the men using such machines should have a very good pad on the left shoulder to take the strain from the collar-bone. I dare say most of us noticed that when the guardsman knelt down with the machine here in order to rest it on the ground the machine showed a tendency to run forward and backward, and I therefore think some arrangement should be made for putting a pin through to prevent that, so that the wheel when on the ground should be perfectly steady. Without such an arrangement, steady fire is impossible.

Captain BADEN-POWELL, in reply, said:—First of all as regards the Maxim gun which Major Anstruther-Thomson spoke about, I am sorry to say I cannot give him the desired information. I wrote to Mr. Maxim to ask what was the weight of his lightest gun, because some time ago he showed me a new gun which he had just produced, which was very small and light. He wrote back saying:—"We have never yet mounted a gun on a bicycle, but we have on a tricycle. The guns without water-jackets weigh 25 lbs. each; with the water-jacket 32 lbs. They can be carried on a bicycle." That is all the details he gives. I should imagine the bicycle itself would form if not a sufficient tripod, at all events assist in forming it.

Major ANSTRUTHER-THOMSON:—The Americans have got a machine gun of that sort mounted on a bicycle.

Captain BADEN-POWELL:—Several of the speakers have taken exception to the idea of using the bicycle for transport purposes, but they seem to miss the point. I endeavoured to show that this would only be done in cases of *emergency*. I mentioned several cases in which it might be most desirable to use them for such purposes. Then, with regard to wheeling uphill,—of course if a hill is very steep

it is difficult to get up it, whether you are wheeling your machine or carrying it; but I am inclined to think there are a good many hills you could not wheel your machine up; at any rate, you would have to seize it by both handle-bars and push away very hard. It is very difficult to wheel a machine up a steep hill, especially when heavily loaded. Although carrying it would not be much easier, I think myself it would be somewhat easier. As to those foreign bicycles mentioned by Colonel Gunter, the "Styria" and the "Adler," I have only seen reference to them in the papers, and I have been trying to find out what they are. I wrote to Germany for details but was unable to procure them.

Colonel GUNTER:—You will find them described in a German paper of which I will give you the details.

Captain RADEN-POWELL:—Thank you. As regards the weight, one of the speakers has said 40 lbs. might be rather heavy. In that particular respect I got the expert opinion of some leading makers—Mr. Pugh, of the Rudge-Whitworth Co., and Mr. Starley, of the Rover Co., and others—and they considered the average weight for a thoroughly strong machine ought to be pretty well 40 lbs. As regards the despatch of forces, say from London down to the South Coast by bicycles instead of by rail, although it is true, in peace-time, when plenty of preparation has been made, you may be able to despatch a force in a very few hours by railway, the chances are that on service, when you have no time to make preparations and suddenly find you have to despatch a force, the lines may be so blocked and unprepared that I do not think troops going by rail would get there in much less time than by bicycle. Then, in addition to that, some troops could be sent by rail, while others were being sent down by cycles. As regards shock action, I am afraid I have been taken rather too seriously. It is the same as regards the transport. I was rather referring to certain particular occasions when it might come useful. I cannot help thinking, as I said before, that the occasion might come—I do not say it would be usual—when, where you have good open ground, a force of cyclists could make a dash towards the enemy and then dismount and charge. Though I suppose nobody has had experience of it, certainly I think that in going along a road and finding your way barred by a small force of the enemy, you might ride straight up to them. Although not quite the same thing as shock action, the moral effect on the enemy of seeing the cyclists coming rapidly down upon them might be sufficient to cause them to turn and run. As regards the revolver, although I should not care to be anywhere near whilst men were practising firing with it from a moving bicycle, still I do not see why they should not be able to make fairly good practice with the revolver; it certainly would have a certain amount of moral effect. If a cyclist was coming along a road firing a revolver right and left you would probably get out of his way. As to the machines being readily disabled, of course that is one of the points about this particular bicycle of mine. It is merely a matter of turning the screw to take the handle straight off and you can take it away with you, as it is very light and easy to carry. As soon as you get back to your machine you can put it on again. I think that is really all I need say. There are a good many machines here, and I shall be very glad to show them to anyone who requires more details. The French Gérard machine which I have here is unfortunately a very old one, the only one I have been able to get hold of in England; but it shows the general mechanism. Sergeant Rule of the Cyclist Volunteers, and Mr. Thorn of the London Scottish, have brought their bicycles here with the full Volunteer equipment on them, and it is very interesting to see how the equipment is attached, and how the rifle may be carried. I thank you all for your attention.

The CHAIRMAN:—I would ask you all, gentlemen, to second me in a vote of thanks to Captain Baden-Powell for the most interesting lecture we have received from him.

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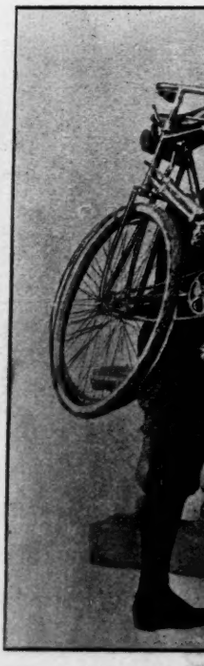

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OFFORD'S FOLDING CYCLE.

J. J. KELLHER & CO., LONDON.

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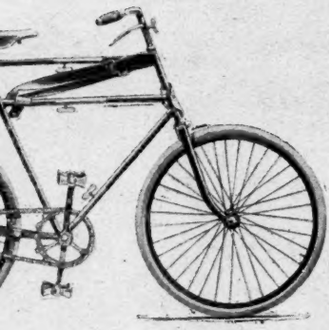
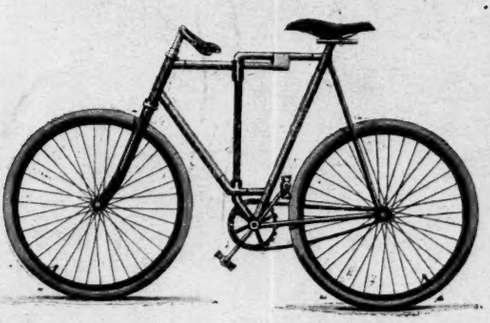


5.
"BELGICA" CYCLE.



6.
THE "FOLDER" CYCLE.

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THE "GÉRARD" FOLDING CYCLE.

THE STRATEGIC RELATION OF PERSIA TO BRITISH INTERESTS.

By the Rt. Hon. Sir RICHARD TEMPLE, Bart., G.C.S.I., C.I.E., D.C.L., LL.D., F.R.S.

Wednesday, May 3rd, 1899.

Sir LEPEL GRIFFIN, K.C.S.I., in the Chair.

LET us think what is the reason why you and I are here this afternoon. Surely it is Russian policy in Asia. You have all noticed in the newspapers that Russia has signed an agreement with us upon China, which may prove to be of the most far-reaching consequence. In that respect she has behaved well, and I wish she had always done equally well. The burden of my song this afternoon will be to see whether we cannot induce her to behave in a somewhat similar manner in Persia. She has turned over a new leaf, we hope, in China. I can assure you that there is a very large leaf which she may with equal advantage turn over in Persia. Although I appreciate in the most friendly manner all that she has done at this moment in China, I must yet report to you that in Persia, and elsewhere in Central Asia, her policy has been as bad for us as it could possibly be. I do not say bad absolutely, but bad for us. No perceptible object is there in all her policy except to embarrass us; no advantage to her that we can see is to be gained by that policy of hers except our disadvantage. We begin to hope now, that if she does well in one part of Asia for us, she may be induced to do equally well in that part which I have to bring before you this afternoon. I shall develop this point, of course.

I wish my address to-day to be taken in connection with the one that I delivered to you last autumn upon our Indian frontier. The conclusion of that address was this, that if Russia were to attempt to advance upon Herat, having scooped out—mark you, scooped out—by a bad delimitation a great piece of Afghan territory in order to get near Herat, close also to this frontier of Persia—if she were to advance further towards India, I showed you that she would have tremendous difficulties in the matter of supply and transport, such as would render such advance well-nigh impossible. Now, I have since been told that, appreciating these difficulties, Russia will try a new plan: she will probably follow the example of our Lord Kitchener in Egypt, and will try, in her advance upon India, to make a railway for herself as she goes along. We know the great success with which that was done in Egypt. I have had similar success myself in the desert near the Indus. But it is a very different matter to do anything of that kind when you have to move 100,000 men with modern armaments and all the requirements of stores and materials. What advance would she make by making a railway over

such a course as that? Mark you, 100,000 men is the least number. Say she leaves 40,000 behind her near Herat and advances with 60,000, then there would be 20,000 to guard her rear and 40,000 to be put into line to do battle with a British army corps near Kandahar. With such a force as that, what kind of progress would she make with a railway day by day? Would she do a mile a day? I doubt it. Even if she did that, it would take her just one year from the time she left her own frontier before she had the honour of seeing a British red-coat. Well, if, on the other hand, we choose to meet her, not at Kandahar, but within our own frontier, it will take her one and a half years or one and three-quarters. During the whole of that time she has to bear the strain of being at war with us all the world over. After the revelations of her Finance Minister, M. de Witte, the financial world can judge whether she could possibly bear such a strain as that. I have to repeat, gentlemen, what I impressed upon you before, and which I shall impress upon you every time I have the honour of addressing you, that you must keep for England that great interval between Herat and Kandahar as an interval which can only be passed with immense difficulty. That interval is to India as against Russia what the British Channel is for Britain as against the Continent. They are exactly the same. I mention this because there are some talented people who say what a blessing it would be if railways could be constructed right across Afghanistan, so that in the junction between the British system and the Russian system the Russians might shake hands with us in that quarter. It would be like a lamb shaking hands with the claw of a bear. It would give Russia exactly what she wants, and it would be just the same if anybody were to say, "Why, what a blessing it would be if the British Channel could be dried up, and we could drive across and see our friends in Germany and France without going over the water! What a blessing if we could drive over dry land!" Yes, it would be very convenient in time of peace; but what would become of your safety in time of war? Think of that analogy. I assure you it exactly applies to this most important case in Asia.

I impress that upon you, because I am anxious that you should dwell on that for one moment, before I approach Persia proper with reference to that very important point on the border of Afghanistan and Persia, that is, Seistan. Now, Seistan lies exactly on that frontier a little south, or you may say considerably south, but still within a measurable distance of Herat. It is quite possible to run a railway from our Quetta, in Baluchistan, right across to Seistan, and many people have projected such a railway in general terms and have advocated it. I have heard our English Government chided because it does not undertake it. Now, the British Government has held its hand in that respect, and I think will continue to hold it, for that is a very dangerous project. In the first place, commercially it would lead to nothing. It would be undertaken at a great cost and difficulty, and when it was done what exactly would the effect be? Seistan is a swamp and somewhat desolate, but it has been grand and fertile in former days, and would be so again under good

administration. But what would a railway conducted thither point to? Well, in some respects to nothing at all. First of all, it would face the great Persian Desert, and though by a caravan route it might get across the Salt Desert to Kerman—which is a very important Persian town in south-eastern Persia—or might try and work its way due south down through Mekran, that would involve it in enormous engineering difficulties and ultimately lead to nothing, or at least to nothing that could not be much better approached by the sea. All these things are obvious, and show that such a railway would be of little or no use. But would it serve no other purpose? Yes: a railway towards Seistan could be made by Russia right through Meshed in north-east Persia, starting from that very line which is advancing upon Herat, all along the northern border of Persia, that is in Turcomania. If we strained our political rights and made a railway to Seistan, then suppose Russia were to answer us by making a railway right through Khorasan, by Meshed in north-eastern Persia from her own line, that very line which is approaching Herat; why, the very thing will be accomplished which I am deprecating. We should absolutely have a junction connecting the Russian line in Turcomania with the British line in Seistan; and we should have a straight line of communication right through to Quetta—that is, right up to British territory itself. At present Russia has no intention except to take her Turcoman line outside the British sphere. If we were to make a line to Seistan, and she were to join it as above indicated, then our position would be turned and the dividing interval, as already explained, would be lost to us indeed. This all-important vital interval would be bridged over in a manner more dangerous than the one I have been deprecating. Therefore I hope that this Seistan project will never be thought of, much less undertaken, until we shall have come, if we ever do, to a definite determination with Russia—how much of Persia shall be her sphere and how much our sphere; and that is the burden of my song, as I stated at the outset. But I ought to add that even if we did arrive at such an understanding, there might still be political impossibilities in any railway by Seistan.

Now then, I shall approach Persia proper. I shall not attempt to describe to an expert audience like this the geography of that wonderful land, that ancient, romantic land. I must assume that you all know it, because I have not a moment to lose, considering the immense national arguments which I have to bring before you. But I must just remind you that Persia is bounded now on the north by the Caspian, which is a Russian lake, and the British Channel is not more under the supremacy of the British fleet than the Caspian is under the Russian military and naval arrangements. The rest of the northern frontier of Persia is bordered by a long line of railway from the Caspian to the Herat border, and north Persia is entirely overshadowed by that great means of communication. On the west Persia is bounded by what may be called sub-Caucasia, namely, the fine tracts of Georgia with Tiflis and the like, and with the range of mountains down as far as Mount Ararat. Then on the east, of course, Persia is bounded by Afghanistan and by British

Baluchistan. Remember, Persia has a share of Baluchistan; she is bounded there by British Baluchistan. On the south and south-west she is bounded in the most important manner for British interests, first of all by Mesopotamia and the joint stream of the Tigris and Euphrates before they run in one united volume to the Persian Gulf. Then in the south is the Persian Gulf, which I have to show you is a British lake, as it ought to be, and, when we choose to make it so, is just as much British as the Caspian is Russian.

That being my general definition of the country, I wish, for political purposes, to divide Persia into two parts. First the northern, or upper, and then the southern and south-eastern, or lower part. Now, as regards the upper part, you may make up your minds that it is has become Russian irretrievably, and that not by any immediate process, but by a process that has been going on all through the century. Let me, on the tips of my fingers, recount all the steps by which Russia has accomplished this great achievement, that is, the mastery—not the overshadowing supremacy, but the absolute mastery—over the upper part of Persia. First, she tore from Persia the beautiful province of Georgia, the various parts of Asia Minor underlying the Caucasus. Then she picked a quarrel with Persia, and the consequence of that was, that some more bits of Asia Minor were taken, adjoining Persia; and above all, the Russian dominion over the Caspian was secured. Previous to that, it was Persia who was the mistress of the Caspian; after that it was Russia. I need not say that this Caspian marine communication is an important link in the chain of communication which Russia has established between her European possessions and the Afghan frontier towards India. Then of course there was the Crimean War, and that developed a great deal of trouble in the Caucasus. You remember how the brave Circassians, after the war was over, were thoroughly exterminated. That thoroughly consolidated the Russians' position on the great line from Europe towards India. There was Georgia conquered; the Caucasus thoroughly subdued by the extermination of the mountaineers; the conveniently situated River Araxes being made the boundary in that quarter between Russia and Persia—the entire subjugation of the Caspian—and then what came next? The subjugation of Turcomania. Now we, for a long time, had a great interest in Turcomania, and the question was whether Merv should be Russian or British.

It was too far off really for Britain, but it was comparatively handy for Russia, since she got possession of the water-carriage of the Caspian. In vain did the most far-sighted and experienced British officers in Asia warn the British nation, over and over again, that if we allowed Russia to get Merv there would be no means of stopping her until she got to the Herat border, and that was called "Mervousness"! It really was the patriotic foresight of the bravest and noblest of the sons of England! Well, of course, we could not stop Russia going to Merv by any force we could have sent there, but we might have employed the whole of our British diplomatic power in Europe, and told her that if she went to Merv she would have a row with England. But we let her take it in the

most ruthless and thoroughgoing manner by the troops of the famous General Skobeleff. From that time Turcomania was subdued, and Turcomania lay right along the north-eastern border of Persia, and brought Russia into very measurable distance of Herat.

That is a brief sketch of the progress of Russia in that quarter. After that you may as well give up that upper part of Persia as lost, as far as British influence goes. We, of course, have a Consul-General at Meshed, and as usual some command of the money market in that quarter. We have, too, a Minister in Teheran, which comes within this upper quarter; but he is not there for the upper quarter, but to represent British interest everywhere in Persia, and his influence is derived not from any authority we have up there in the north, but from the potential power we have in the south, in the Gulf and elsewhere, as I shall endeavour to show you. So I repeat, you may as well give up at once, as past praying for, the upper part of Persia. Russia has got it. Whether it was through our neglect or not it is futile to enquire, but got it she has, and we must take the consequences and try to retrieve the misfortunes, such as they are, by our achievements elsewhere. It is the old story: Russia does one thing in one place, and we must do something more than equivalent in another; just as when she took Port Arthur we capped her by taking Wei-hai-Wei. If she has taken northern Persia we will cap her by doing the same in southern Persia, only we shall do it beneficently for the Persians. What good she has done to Persia as yet I do not undertake to say; but I am anxious to be very fair to Russia. I speak of her without reserve, because really the time has passed for mincing matters in these grave affairs. I am willing and anxious to do her justice. I admit she has done good to Persia, to Khorasan, and Meshed, in the north-east portion of Persia, by her conquest of Turcomania. She has stopped, in a great measure, the awful raiding that used to go on there. You have heard dreadful stories of slave-hunting in Central Africa, but I assure you those horrors are surpassed by the horrors which used to go on between Turcomania and the Persian province of Khorasan. Raiders used to come into the Persian villages, tie the women and children to the tails of the horses, and drag them helplessly into slavery across the desert. Russia has stopped that in a great degree—although I am not quite sure she has entirely stopped it—but she has stopped it in the main, and for that she deserves credit and honour from every lover of humanity. Now I say that part of Persia must be given up. Just let me enumerate what the provinces are.

Adjoining Georgia and the River Araxes there is the finest part of Persia, namely, the great lake of Urumiah, now so well known in the religious world of England on account of the Nestorian Missions which have been protected beneficently by the Church of England under the Archbishop of Canterbury. There is the lake and the province, or strip of land, between the lake and the Russian frontier and also a part of what is now the adjoining Turkish frontier. Now, there is nothing whatever to stop Russia to-morrow from coming across the border and helping herself, without the least opposition from anybody, to that which

is the finest, coolest, most delightful part of Persia. It was, I suppose, in ancient days one of the gardens of the earth; now it is one of the finest parts of Persia and of Asia. All that could be taken—also the northern province of Persia near the Caspian, all that fine range of Elburz mountains above Teheran; and Teheran itself could be taken. Really Russia might, by lifting her little finger to-morrow, have them all. The whole of Khorasan, with its headquarters at Meshed, with the sacred shrines, she has merely to walk across to take as much of it all as she likes. She does not do so now because she is afraid of having a row with England about other things. She is apprehensive of having the whole Persian question raised by England if she touches Khorasan. But she looks upon it as a ripe pear that is going to fall into her lap some day.

Now, what I want to impress upon you, my friends, is this, that without attempting to cry over spilt milk or to regret what is passed, and without any recrimination as to whose fault it was—let all that go; it has all happened and we cannot prevent it—much more is going to happen which we are also unable to prevent, and we had better make the best of it with a good grace, a smiling grace if we can, and then see what we can do for ourselves in another direction, which shall more than counterbalance all we have lost there. That is the true British plan; and it is by considering where our strength lies and how we can exert it that we shall observe the best interests of our nation.

I have described to you unreservedly the upper part of Persia. Let me just mention to you the lower part of Persia. First of all let me remind you that the basis of our power there is the sea. We have, of course, unassailable access by sea to the Persian Gulf. You go from India first of all to the Gulf of Oman. "Oman's green waters" the poet spoke of, and the fort of Muscat, which if I can find time I will allude to briefly, although it does not come quite within the Persian purview. Then you get to Cape Mesandom, right opposite Bander Abbas, which is the Strait of Ormuz. Now, Ormuz is one of the names most celebrated in the songs of ancient times and in the associations of mediæval centuries. You get to Bander Abbas. Of course, some French journalists were good enough to tell some of our friends that Russia was going to have some interest in Bander Abbas. You might as well say that England was going to have some interest in Krasnovdsk, the great military port of Russia on the Caspian. If we allow any Russian interest at Bander Abbas we may as well give up the game altogether. Russia would not have to make such a move, or if she did, I hope the British lion would begin to roar in earnest. But I do not believe that for a moment. Bander Abbas is particularly a British port. It has always been so since it was given up by the other Powers who have long since yielded to England in the East. The trade there is entirely British, and everything there is in British hands. Then you go up the Gulf and you get to Bushire. Now, Bushire was a point on which we landed troops in 1857 for our attack upon Shiraz, because Persia was threatening Herat. It was one of the means by which we compelled Persia to give way, and we made that the basis of one of our military operations. Since then, we have always

kept a British Resident there and the British flag floats there to-day. The trade there is British—everything there is British. There is no other influence there but British influence, and that place is the capital of the Persian Gulf. Then in front of Bushire and not very far from it is the Isle of Karak. That island we occupied during the war, and it was a thousand pities that we gave it up after the war. We should have kept it. But now we could take it to-morrow if we wanted it. We have only to send a gun-boat and put up a British flag, and it is ours. So much for the Persian Gulf, and recollect that that has always been a British lake since I can remember. We have policed it with our ships of war and we have kept down piracy. We preserved the pearl-fishing, and we have done everything a civilised Government could do to maintain something like law and order and civilisation in the Persian Gulf. If there is a British lake in the world it is the Persian Gulf—I never heard anything else. When I was Governor of Bombay if anything went wrong in the Persian Gulf a telegram was sent to me, and I got the Viceroy's permission and spoke to the admiral on the Bombay station, and I immediately took measures to put an end to the mischief. I believed certainly, and the Government which I had the honour to represent, and the Viceroy whom I had the pleasure to serve, also believed, that I was the chief police officer of the Gulf and of those waters. Fancy telling me that any other Power is to share dominion in those important waters with my Government and my nation that I had the honour to represent!

Well then, passing from the Persian Gulf we get to the mouth of the joint river—Shat-el-Arab—well, never mind about the name—which is the joint river of the Tigris and Euphrates. You remember those two rivers join, and then flow in one stream to the Persian Gulf. At the upper end of the Persian Gulf there is a tongue of land, at the end of which there is a place called Fao. Now, Fao is getting its name mentioned in the papers nowadays. What is Fao? It is the strip of land, I believe, upon which the Turks recently, in defiance of their treaty engagements with Persia, erected a fort.

You will remember the arrangement was that Persia was not to erect any forts on her frontier, and Turkey was not to erect any on hers. Turkey broke her agreement by erecting this fort at Fao, and when remonstrated with by Persia calmly told her "You can do the same on your frontier." Such, then, is Fao. Yet we were told the other day that Russia, of all people in the world, is going to attempt to have some interest at Fao! Why, Fao is a Turkish position; how can Russia do such a thing? If Turkey is going to surrender one of her positions of her Asiatic dominions to Russia she will at once have a burning question to face. You will remember that under the Treaty by which we hold Cyprus, all the Asiatic dominions of the Sultan are under the protection of Britain as against Russia. Of course, if Russia attempts to touch Fao we should have a burning question with Turkey. Can you believe that we shall allow Russia to touch Fao? If anybody touches Fao it will be the British.

So much for the mouth of the river. We then go up this river to Bassora, at the junction of the Tigris and Euphrates, the well-known trading place. You go up the river, and on the left side is the Turkish boundary, and on the right is the Persian boundary, and then you get to Bassora. And what is Bassora? In my day there was always a British Agent or British Resident there, and Bassora was in essentials policed by the Government of Bombay. The first thing I recollect on taking charge of the Government was, that I got an urgent telegram from Bassora, saying there was a disturbance, and could I get a war-ship sent up the river to answer for law and order. I took the pleasure of the Viceroy and spoke to the admiral on the Bombay station, and we sent up a ship and stopped the row. This looks to me very much like a British sphere of influence and British supremacy; indeed, British dominion really. Now, before you get up to Bassora, from the Gulf, you pass a town named Mohammera. I suppose you have forgotten that name now, but let me remind you that forty years ago it was familiar in every London newspaper, because that was the second base of our operations in the war with Persia in 1857. One base was at Bushire, towards Shiraz, which I have mentioned, and one was at Mohammera, near the mouth of the Karun, which is a tributary of the joint rivers of the Tigris and Euphrates, and which runs right through the south-western, or as we may call it, southern Persia, and crosses one of the finest parts of Persia. It is a navigable river. It used to be protected by great hydraulic engineering works which did honour to the ancient Persian dynasty, and all of which could now be repaired. We sent a British force up this river as far as Ahwaz, which is near where the river debouches from the mountains near Shuster. We went up this river Karun, and it was owing to these movements, in conjunction with other movements from Bushire and the Gulf, which I have explained, that Persia was obliged to make peace, and we wanted her to make it quick. We needed just then every one of our soldiers to help us in the Indian Mutiny.

All these are the vestiges of British dominion which has been very powerfully enforced within the memory of half the people present here at this moment, and these are the measures which do really represent the bases of the British sphere of influence.

Let me now consider that if I really cede—willingly cede, because you had better agree to the inevitable—the northern provinces which I have already explained Russia has got; let me now consider the provinces which by parity of reasoning I have ventured to claim for the British lion, and for the red line. Well, of course, I should like to see a line drawn right across the centre of Persia. I should begin just north of Seistan, and you will see why I dwelt at the outset so much on Seistan; naturally Seistan must be within the British sphere. Nothing should induce us to let Russia get near it. I begin north of Seistan, and then draw the line across the great Salt Desert. There is a mighty desert in that quarter, or rather a chain of deserts. There are two deserts called Lut, with a short caravan route between them leading from Seistan towards Kerman. Then these two deserts are divided one from another by this caravan route, and

above that there is the great desert called Kavir, the worst desert of all, and that, of course, I would leave to Russia. But the other desert must come within the red line, because that is necessary to preserve the caravan communication between Kerman, which is really the capital of eastern Persia, and Seistan. Then I should like to draw the line going slightly to the north, up to Yezd. I do not care about the desert, but we must have Kerman within our red line. Then we must go north and have Yezd, which is the second important town in eastern Persia; and then we must draw the line straight to Ispahan, which is the old capital—kingly, imperial capital—of Persia. The modern capital is Teheran, which has fallen hopelessly to Russia; but we will have Ispahan. Then from Ispahan you draw the line straight across to Mesopotamia, somewhat south or below what is now called Hamadan. This Hamadan is only a Persian name now, but every classical scholar will remember it was called that because it was the Ecbatana of ancient times, more especially of Alexander the Great. Everybody who has read Alexander's campaign will remember that. We draw the line from Ispahan to the Mesopotamian outlying districts by Kermanshah, and I would include the districts about Disful. Now Disful lies a little to the north not far from Shuster in the Karun valley. It is of the highest possible interest. I suppose Disful is perhaps the second, if not the first—at any rate the third—most classical site in all Asia. Disful was Susa. Now Susa, remember, was the capital of Darius. When Alexander won the decisive battle of Arbela, Darius fled towards Susa. Babylon in those days lay to the south and had lost its importance. Susa was in the very acme of wealth and prosperity. It was here that the conquerors rushed, seized all the family of the vanquished Darius, and got the masses of treasure, in many millions sterling worth of silver bullion. There are the mounds still remaining which mark where once the walls and towers and temples and palaces of Susa stood in all their splendour. That is about the place which I should like the British line to include running from Ispahan to Kermanshah. Then going south, of course, we take in all the Karun country, and so we should work our way by the head of the Persian Gulf to Shiraz. Now, Shiraz is the most beautiful place in all the country of the Persians. It is the home of all their poets, all their best literature is there, and all their most beautiful scenery, and that, of course, would come within the red line. And so we should work our way down towards our own frontier at Baluchistan. I am not drawing these points of the proposed British sphere as British dominion, but as districts within British influence, that is as much as Teheran and the other districts in the north would be under the Russian sphere. In fact, these districts are still under British influence, though, of course, our influence may be weakly or powerfully, effectively or ineffectively exerted; just as Russia has the power of doing what she likes in the north, so we have the power of doing what we like in the five provinces which I have been mentioning.

If these spheres of influence are to exist, why not say to Russia, "Well, it is no good our quarrelling about Persia, and about influence in Persia: of course we assume you are not going to annex it, and of course

we are not; but we both wish the prosperity and integrity of Persia." These are the kind of expressions always used. We might mutually guarantee all this to Persia; but neither we nor Russia could guarantee this, that Persia shall not fall to pieces by her own dead weight. You know there is a phrase "A dying nation," and certainly if there is a dying nation in the world it is Persia. Her prosperity is decreasing, her population is said to be gradually lessening; or even if it be gradually increasing, still it is infinitely less than what it once was. The sand, owing to bad arrangements, is encroaching upon some of her best places, and she is gradually giving way all round. There is no time for me to go into it this afternoon, but if I were to explain the difference between Persia of to-day and the Persia of Xerxes, Darius, and Cyrus, you would hardly believe it. I suppose there were more fighting men in the armies of Cyrus than there are male inhabitants now in all Persia. This is greatly owing to the reckless administration, to the destruction of forests, the decay of the irrigation works, and a hundred other things. You hear of "The Earth as Modified by Human Action"—a clever American book. The most signal instance of that is Persia. Yet Persia had the most magnificent territory in former times. Every schoolboy knows how grand Persia was. All that grandeur has gradually slipped away, owing to bad management. It is going, and will ere long be gone. So we should say, of course, to Russia:—"We guarantee the integrity and independence of Persia for the present; but if Persia falls to pieces, then these two spheres will be set up"—and our respective spheres might be set up even now. We may, by those means, prop up the falling kingdom, but in the meantime we may have this agreement between the two great Powers. That is the substance and the sum total of my discourse this afternoon. We have the power to enforce our position in the south of Persia. We have only to exert it. The country is near the high road to India. If we were to let Russia get to the Persian Gulf we should have an enemy on our flank upon one of the most important of our communications. I ask every naval and military man in the room, What is the great line of British communication in the world? Is it not that which goes through the Mediterranean, traverses Egypt, goes down the Red Sea, crosses the Indian Ocean to Ceylon, to China, to Australia, and everywhere? That would be the very line which would be threatened by having a hostile Power in the Persian Gulf. We could never tolerate it, of course. Therefore we must see to our interest in Persia. That is why, for the sake of our Indian Empire, our Far Eastern sphere as it is going to be—for the sake of all and every interest, European and native, which we have, even in the antipodes, the eastern antipodes—for the sake of all these we must have this water communication without any sort of impediment, without anyone near our flank, in any part of it. Therefore we must stick to the Persian Gulf and everything that relates to it. And we cannot keep the position we have unless we have influence over the shores that surround it. And after all, if the Shah were to say, "I cannot stay in Teheran; the Russians are going to put an officer in the place"; we would say, "Never mind, Your Majesty; come to us inside

our line; set up yourself at Ispahan; or if you think that is too near the Russians, come down to Shiraz, the home of all that is glorious to the Persian nation." We must not say too much to His Majesty about the Persian writers, because he is not of that race himself, although he is so technically. We should have to say to him, "Come to Shiraz and the British protection, under the ægis of the Queen-Empress, and there you shall set up your own throne close to all the remains of Xerxes and the monarchs of many dynasties. Come to Shiraz, which is still the most classical and romantic and poetic place in the imagination of every Persian, and set up yourself there. Then you are within measurable distance of the British fleet, and you are safe against all comers; and then the influence of southern Persia, by Your Majesty's kind assistance, will be given to England. We will give you position, prosperity, such as your people cannot afford, and add dignity to the home of your ancestors, and you will be perfectly safe under the protection of the invincible British flag." That is my idea with regard to Persia.

Now, if I have two more minutes I will say a word about Muscat. When I was asked to deliver this address I was requested to mention Muscat. Now Muscat, of course, is not in the Persian limits; it is round the corner of the entrance to the Persian Gulf, and really in the Sea of Oman in Arabia. But Muscat is entirely within our political sphere; it always has been within my memory, and that goes a long way back. It has always been British. Its family was connected by a sort of cousinhood with the family at Zanzibar. In my time the arrangement with the two families used to be made simultaneously. It seemed to me possibly an oversight that when we settled all French claims at Zanzibar we did not take the opportunity of clearing all French claims out of Muscat. France took the opportunity of clearing our interest out of Madagascar, and she might have conceded our position in Muscat as well as in Zanzibar. That was not done; but never mind—Muscat is ours, and our rights must be enforced by arms if necessary. Muscat is under treaty with us. The Sultan really cannot do anything in his external relations without us; he cannot make any concession to any foreign Power without us; and when he dared to make a concession to some French gentlemen, which, of course, was not approved of by the French—though if it had been successful it would have been approved of, and if unsuccessful disavowed—when he did that he really did incur the just displeasure of the Indian Government; and I am very glad the British, without a moment's delay, sent a man-of-war up to point its guns at the palace and to force him to give the concession up. That is what must be done and can easily be done. France gets a coal-shed, she is welcome to that; but Muscat is absolutely ours, and that must be insisted upon. I do not suppose Russia would dream of going so far, but France might. At any rate it shows she would if she dared. That would be introducing a foreign Power into the inconvenient proximity of our great line of naval, military, and commercial communication.

Now, ladies and gentlemen, I must not detain you unduly. I hope that I have succeeded in making clear to you my meaning as to what

our British interests in these countries are. Pray remember always that in Britain we are ruled not only by Queen, Lords, and Commons, but also by public opinion; and if a well-informed public opinion demands that certain of British interests be protected in a certain way, that protection will be given, no doubt, with all the might of the Empire. I trust that you will consider the growing importance of our interests in the East which are now joining on fast to our interests in the Far East. Remember that, great as these interests have been when we were young, they are doubly or trebly greater now and likely to grow to an indefinite extent; and its extent will severely tax all our national resources. We must omit no precaution that shall conduce to safety, leave no points unguarded that will assist us. If we allow this, that, or the other to be done by foreign nations endangering and embarrassing us, then we shall have the greater difficulty of looking after all the countries and dominions under our charge. Even now we have enough to do if our interests are to be guarded from every possible point of view. But if they are insufficiently guarded, the task of maintaining our Empire in the East and the Far East will be beyond even the powers of Britain. I do think this is a very good time to try and come to an understanding with Russia in these matters, because there are classes in Russia, to my certain knowledge, who say there is not room enough for both Russia and England in Asia, when sometimes it is said there is room for both. I repeat, there is a party in Russia who say there is no room for both. That means they are to be everywhere and we are to be nowhere! Ah, well, we will see to that! But although there is a party of that kind, on the other hand there is a reasonable party, particularly in the banking and commercial world, who are becoming very anxious to have better relations with us, and that sentiment might very well be found in the recent utterance of M. de Witte, the Russian Finance Minister. We can do more in the way of lending money and promoting trade, and taking for valuable consideration the products of Russia, than any other nation. Considering that we have thus a great hold upon her, we should not let so favourable an opportunity pass in coming to a thorough understanding with her. We should sufficiently guard our equal and more than equal position and interest with her throughout that great quarter of the globe which is called Asia.

The CHAIRMAN (Sir Lepel H. Griffin, K.C.S.I.):—Before asking any of the experts who are present, and of whom I see several well competent, to speak upon this subject, I think as Chairman you will permit me to detain you a few minutes. Not having had the opportunity of reading beforehand Sir Richard Temple's exceedingly able and eloquent address, I think, as Chairman, it is my right to take the opportunity of expressing the points in which I somewhat, with all respect, venture to differ from the lecturer. After all, the duty of the Chairman is not absolutely confined to concurrence, and although there is no one in the room—not even Sir Richard Temple himself—who is a more confirmed Imperialist than myself, yet in dealing with a country like Persia, which is an independent monarchy of the greatest interest and importance, it is wise not to assume too much. I would not venture to criticise any of the remarks made, were I not in a position intimately to know Persian politics of to-day. As the Chairman of the Imperial Bank of Persia, which has already done so much for the country,

and which will, in the future, do so much more, I am fully in the position to know the state of affairs, not only in Teheran but in all other parts of the country, from which reports reach us, I may say, almost every day of the week. First, I would ask you, What are the points which struck you most in his eloquent address? They seemed to me, as I listened, to be two: first, the impossibility of England contending with Russia in the north with any degree of success; and, secondly, the supreme importance to England of the command of the Persian Gulf. I think most military men present, and perhaps all of you, will agree that those are the principal points of importance. Well, with regard to the Persian Gulf, let me say once for all that I most cordially concur in every word which Sir Richard Temple has said. The Persian Gulf is, and should remain, a British lake. It has been so since the beginning of this century, and it will be a very bad day for England when any Government retreats from that position. This I say with no possible degree of disregard for Persian rights. Persia has no Navy, and the sea, and especially the Persian Gulf, belongs to Great Britain. The only point on which I wish really to express, not my disagreement with Sir Richard Temple, but a different way of looking at things, is the amount of influence, or, as he termed it, supremacy, possessed by Russia in northern Persia. There is no doubt that if you look at a map and see the Russian frontier running from Tiflis to Ashurada and Merv, right along the north frontier of Persia, you will perfectly understand that a monarch who can put three million soldiers in the field, could send his troops across the frontier and occupy all northern Persia without our having a word to say. Admitted. But, ladies and gentlemen, this is the nineteenth, and soon will be the twentieth, century, and I say that in the conscience of Europe there is no place for such an act of violence directed against an absolutely unresisting and innocent neighbour. These things are passing more away than you imagine. Persia is not China, and when there is a country with an ordered administration, speaking civilised European languages, and with diplomatic representatives in the European Courts, it is not possible for Russia, except under the very gravest provocation, and in most exceptional circumstances, to take this particular step. There is a moral objection – I do not use the word "moral" in an ethical sense, as you may imagine—but there is a strong moral objection to such a course as that. The second objection to it is that Persia and the Persian Government infinitely prefer England to Russia. This to us in northern Persia is an enormous political advantage. The Persians know perfectly well—and I wish by my voice I could press it upon you all—that England does not desire anything of Persia except an open door, the extension of her commerce, and the prosperity of the country. That is all we want, and all we shall continue to want. The Persians understand perfectly well that Russia desires more, but at the same time the Russian advance at the present time is on the same lines as our own; it is a commercial advance, and the great part of their advance I do not think we need in any way grudge them. The Russians are making a road from Enzeli and Resht to Kazvin and Teheran, and an excellent thing it is that they should make it. It does not give them more than a commercial command of that part of the country which undoubtedly, as Sir Richard has explained, does extend probably to the latitude of Ispahan. But I say, gentlemen, that the Persian question is very much a financial question, and that is our great strength in Persia. It is a financial question. You are not going to build railways and make roads without money; and if Russia is going, as silly people in Vienna and Berlin assert, to make a railway from the north to a port on the Persian Gulf, that money would have to be found in London, because I do not think they would find it in Paris, and they certainly will not find it in St. Petersburg. I think, gentlemen, that is all I need say. I entirely agree with Sir Richard that an understanding with Russia would be of the utmost advantage. We must be very careful of not saying words which might excite the apprehensions of Persia that we are intending to indulge in the same sort of

proceedings which have been associated with the name of Russia. You must remember, gentlemen, that in the last twelve years where Russia has taken one square mile of territory, England has taken sixteen; so that it is just as well to be a little modest when criticising the proceedings of our most excellent neighbour of the North, who, as far as I can understand, does not possess that diplomatic supremacy which is so generally supposed, and which gives rise to all these ridiculous reports you see in the paper. Not Paris, but Berlin and Vienna, are the nest in which are hatched all sorts of ridiculous rumours, such as that which Sir Richard Temple has so ably attended to in connection with Bander Abbas. What would Russia do with a railway to Bander Abbas if she got it made with English capital? It would only take English goods up the country, and Russian goods would not go that way. The whole thing is preposterous, not to say, as Sir Richard Temple has asserted, that Bander Abbas is almost British territory. This I felt it my duty to say, having taken the Chair, because I feel that Persia only requires good government and the firm and steady support of the British Government to maintain her independence. I do not think the time has come when Russia has either the power or the will to take it from her, if England supports her as England ought to support her.

General Sir THOMAS GORDON:—Having been Military Attaché at Teheran, I have some knowledge of the subject of this lecture, and I shall therefore make a few remarks on what has been said. With reference to the Persian Gulf, it should be known that England is very active with her gun-boats there, and it may be said that they regularly patrol the Gulf at all seasons. In the newspapers lately, special attention was drawn to a gun-boat going up the Shat-el-Arab, the combined mouth-channel of the Euphrates and Tigris, but it is a very common thing for a gun-boat to pass up there to visit Basra, which is a favourite resort at times. The Gulf is patrolled so effectively that the Persian and Arab coast population think that England in some way supports and maintains Persia's authority in the Gulf, and this may be regarded as reason for the fact that Persia looks upon England as a good and strong friend. With reference to Fao, it is not Persia that has an engagement with Turkey regarding that place, but England on the part of Persia. The engagement is that so far as the opposite bank of the Shat-el-Arab is Persian territory, the river channel shall be the boundary between Turkey and Persia. Originally Turkey wished to claim the whole of the channel, and they were the stronger party, but England took the matter up for Persia in order to secure free navigation, and the engagement was made that Fao should not be fortified. There is, therefore, no fort there, but only some necessary small works for the protection of the Turkish telegraph station. Regarding Turkey at Basra, she is quite strong enough there to keep the peace, as she has two corvettes on the station under a commodore, who sometimes acts as governor. There is often an expression of opinion that Russian diplomacy is superior to England's at Teheran. I do not think this is the case. The reason for that impression perhaps is that Russia often appears to get her own way easily in minor matters with the Persian Government; but it should be borne in mind that the members of the Persian Government always belong to Turk and Persian families of the north. All their families, properties, and personal interests are in the north, and it therefore follows that their fears and feelings are more readily influenced; but, on the whole, English diplomacy manages to hold its own in affairs of importance. As a matter of fact, England has not lost position or prestige in Persia. There is only one other point that I would touch upon. The lecturer said that owing to the sad misgovernment of Persia the country had fallen away from its millions, which furnished the largest number of fighting men in the world in ancient times, to its present poor population. The number is now about 9,000,000, and the number is increasing, not decreasing. The destruction of Persia's ancient prosperity was not due to misgovernment, but to the ruthless Arab invasion in the seventh century, followed

by that of the Mongols in the thirteenth century. These devastated the whole country, uprooted the population, cut down the trees and destroyed the fertility of the soil to a vast extent. In the ancient times, forests and fields, habitation and cultivation formed very different landscapes from what is now to be seen. The oases were larger, and the cultivated spaces pressed more closely on the desert tracts, which in area were accordingly very much smaller. Since then the physiognomy of the land and the climate, more so especially in the south, have greatly changed, and the change has produced much of the desolation that prevails in the Persia of to-day.

VIEWS OF ADMIRAL CERVERA REGARDING THE SPANISH NAVY IN THE LATE WAR.

THE VINDICATION OF THE NAVY.

From "La Epoca," Madrid, November, 1899.

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FROM documents known to many chiefs and officers of the Navy it appears that Admiral Cervera expressed himself always ready to give absolute obedience to the orders of the Government; that he pointed out the dangers of a disastrous war with the United States while it was still possible to avoid it; that he repeatedly reported the deficiencies in the vessels under his command; that he persistently offered to come to Madrid to explain to the council of ministers the reasons why our fleet was going to certain destruction; that he was not allowed to explain these reasons to those about to take upon themselves the enormous responsibility of this war; that he was forced to sail without a war plan, against his opinion and that of all the commanders of the fleet, who signed a solemn protest declining the responsibility of the consequences; that finally many of the elements indispensable to put the ships in a fair condition were not supplied to him; that the "Colon" sailed without her turret guns, and some of the Bilbao cruisers with some of their guns and ammunition defective, and at least one of them with her speed very much reduced on account of the state of her bottom.

Deficiencies of the Naval Industry.

In January, 1898, Admiral Cervera wrote to one of his relatives:—

"About two years ago I wrote you a letter concerning our fitness to go to war with the United States. I requested you to keep that letter in case some day it should be necessary to bring it to light in defence of my memory or myself when we had experienced the sad disappointment prepared for us by the stupidity of some, the cupidity of others, and the incapability of all, even of those with the best of intentions.

"To-day we find ourselves again in one of those critical periods which seem to be the beginning of the end, and I write you again to express my point of view and to explain my action in this matter, and I beg you to put this letter with the other one, so that the two may be my military testament.

"The relative military positions of Spain and the United States have grown worse for us, because we are extenuated, absolutely penniless, and they are very rich, and also because we have increased our naval power only by the "Colon" and the torpedo destroyers, and they have increased theirs much more.

"What I have said of our industry is sadly confirmed in everything we look at. There is the "Cataluña," begun more than eight years ago, and her hull is not yet completed. And this when we are spurred on by danger, which does not wake patriotism in anybody, while jingoism finds numerous victims, perhaps myself to-morrow. And the condition of our industry is the same in all the arsenals.

"Let us consider, now, our private industries. The Maquinista Terrestre y Maritima supplies the engines of the "Alfonso XIII."; Cadiz the "Filipinas." If the "Carlos V." is not a dead failure, she is not what she should be; everything has been sacrificed to speed, and she lacks power. And remember, that the construction is purely Spanish. The Company of La Grana has not completed its ships, as I am told. The "Vizcaya," "Oquendo," and "Maria Teresa" are the only good ships of their class; but though constructed at Bilbao, it was by Englishmen. Thus, manifestly, even victory would be a sad thing for us. As for the administration and its intricacies, let us not speak of that; its slow procedure is killing us. The "Vizcaya" carries a 14-centimetre breech-plug which was declared useless two months ago, and I did not know it until last night. And that because an official inquiry was made. How many cases I might mention! But my purpose is not to accuse, but to explain why we may and must expect a disaster. But as it is necessary to go to the bitter end, and as it would be a crime to say that publicly to-day, I hold my tongue, and go forth resignedly to face the trials which God may be pleased to send me. I am sure that we shall do our duty, for the spirit of the Navy is excellent; but I pray God that the troubles may be arranged without coming to a conflict which, in any way, I believe would be disastrous for us."

State of the Fleet.

In the beginning of February, Admiral Cervera wrote to a high official personage:—

"Although I am quite sure that I am telling you nothing new, I think it is not idle, in these critical times, to make a study of the condition of the fleet. We must discount the "Alfonso XIII.," so many years under trials, that it looks as if we shall never have the pleasure of counting her among our vessels of war. The fleet is reduced to the three Bilbao cruisers, the "Colon," the "Destructor," and the torpedo destroyers "Furor" and "Terror." The three Bilbao battle-ships are practically complete, but the 14-centimetre guns, the main power of these vessels, is practically useless on account of the bad system of its breech mechanism, and the bad quality of the only cartridge cases, which have been sent on board.

"The "Colon," which is undoubtedly the best of all our ships from a military point of view, has not received her guns. The "Destructor"

may serve as a scout, although its speed is not very high for this service in the fleet. The "Furor" and "Terror" are in a good condition, but I doubt if they can make effective use of their 75-millimetre guns. As for the supplies necessary for a fleet, we frequently lack even the most necessary. In this arsenal (Cadiz) we have not been able to coal, and both at Barcelona and Cadiz we could only obtain half of the biscuit we wanted, and then only after I had ordered 8,000 kilos to be made here. We have no charts of the American seas, although I suppose that they have been ordered; but at the present time we could not move. Apart from this deficient state of the material, I have the pleasure to state that the spirit of the *personnel* is excellent, and that the country will find it all that it may choose to demand. It is a pity that a lack of better and more abundant material, greater supplies, and less hindrances are wanting to put this *personnel* in a condition to fully carry out its *rôle*!"

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"I note," said the Admiral in another letter, "what I am told concerning the heavy guns of the "Colon." It is to be very much regretted that there is always so much underhand work about everything, and that there should be so much of it now regarding the acceptance of the 254-millimetre guns, because if we finally take them, it will seem that we are yielding to certain disagreeable impositions, and if things come to the worst it seems to me we shall have to accept, as the proverb says, 'Hard bread rather than none'; and if we have no other guns, and these ones can fire at least 25 or 30 shots, we shall have to take them anyhow, even though they are expensive and inefficient. And we must not lose time, so that the vessel may be armed and supplied with ammunition as soon as possible."

Some time afterward, when matters were getting worse and worse, the Admiral was more explicit still. Shortly after the Dupuy de Lome incident he said:—

"I do not know when the "Pelayo" and the "Carlos V." will be able to join the fleet, but I suspect that they will not arrive in time. Of the first one I know nothing at all, but I have received some news concerning the second one, which is certainly not very satisfactory as regards the time it will take for her to be ready. It seems to me that there is a mistake in the calculation of the forces we may count upon in the sad event of a war with the United States. In the Cadiz division I believe the "Numancia" will be lacking. I do not think we can count on the "Lepanto." Of the "Carlos V." and the "Pelayo" I have already spoken. The "Colon" has not yet received her guns, and if war comes she will be caught without her heavy guns. The eight principal vessels of the Havana station have no military value whatever, and, besides, are badly worn out, therefore they can be of very little use. In saying this I am not moved by a fault-finding spirit, but only by a desire to avoid illusions that may cost us very dear.

"Taking things as they are, however sad it may be, it is seen that our naval force when compared with that of the United States is approxi-

mately in the proportion of 1 to 3. It therefore seems to me a dream, almost a feverish fancy, to think that with this force, extenuated by our long wars, we can establish the blockade of any port of the United States. A campaign against them will have to be, at least for the present, a defensive or a disastrous one, unless we have some alliances, in which case the tables may be turned. As for the offensive, all we could do would be to make some raids with our fast vessels in order to do them as much harm as possible. It is frightful to think of the results of a naval battle, even if it should be a successful one for us, for how and where could we repair our damages? I, however, will not refuse to do what may be judged necessary, but I think it convenient to analyse the situation such as it is, without cherishing illusions which may bring about terrible disappointments."

Comparison of the Fleets.

The comparison of both Navies, based upon the studies made in prevision of a war with the United States, suggested to the Admiral the following considerations on February 25th, 1898.

"If we compare the Navy of the United States with our own counting only modern vessels capable of active service, we find that the United States have the battle-ships "Iowa," "Indiana," "Massachusetts," "Oregon," and "Texas"; the armoured cruisers "Brooklyn" and "New York"; the protected cruisers "Atlanta," "Minneapolis," "Baltimore," "Charleston," "Chicago," "Cincinnati," "Columbia," "Newark," "San Francisco," "Olympia," "Philadelphia," and "Raleigh," and the rapid unprotected cruisers "Detroit," "Marblehead," and "Montgomery." Against this we have, following the same classification, the battle-ships "Pelayo," "Infanta Maria Teresa," "Vizcaya," and "Oquendo," armoured cruiser "Colon," and protected cruisers "Carlos V.," "Alfonso XIII.," and "Lepanto"; no fast unprotected cruisers; and all this supposing the "Pelayo," "Carlos V.," and "Lepanto" to be ready in time, and giving the desired value to the "Alfonso XIII." I do not mention the other vessels on account of their small military value, surely inferior to that of the nine gun-boats, from 1,000 to 1,600 tons each, six monitors still in service, the ram "Katahdin," the "Vesuvius," and the torpedo-boats and destroyers, which I do not count. I believe that in the present form the comparison is accurate enough.

"Comparing the displacements, we find that in battle-ships the United States have 41,589 tons against our 30,917 tons; in armoured cruisers they have 17,471 tons against our 6,840; in protected cruisers 51,098 against 18,887, and in fast unprotected cruisers they have 6,287 and we none. The total of vessels good for all kinds of operations comprise 116,445 tons against our 56,644 tons, or something less than one-half.

"In speed our battle-ships are superior to theirs, but not to their armoured cruisers. In other vessels their speed is superior to ours.

"Comparing the guns, and admitting that it is possible to fire every ten minutes the number of shots stated in the respective reports, and that only one-half of the guns of less than 20 centimetres are fired,

and supposing that the efficiency of each shot of the calibres 32, 30, 28, 25, 20, 16, 15, 14, 12, 10, 7·5, 5·7, 4·7, and 3·7 be represented by the figures 328, 270, 220, 156, 80, 41, 33, 27, 17, 10, 4, 2, and 1, which are the hundredths of the cubes of the numbers representing their calibres expressed in centimetres $\left(\frac{(\text{calibre in centimetres})^3}{100}\right)$, we find that the gun power of the American battle-ships is represented by 43,822, and that of ours by 29,449; that of the American armoured cruisers by 13,550, and that of ours ("Colon") by 6,573; that of the American protected cruisers by 62,725, and that of ours by 14,600; that of the American unprotected cruisers by 12,300. Therefore, according to these figures, the offensive power of the guns of the United States vessels will be represented by 132,397, and that of ours by 50,622, or a little less than two-fifths of the enemy's.

"To arrive at this appalling conclusion, I have already said that it has been necessary to count the "Pelayo" and "Carlos V.," which probably will not be ready in time; the "Lepanto," which surely will not be ready, and the "Alfonso XIII.," whose speed renders her of a very doubtful utility."

Impossibility of an Offensive Campaign.

"Now, to carry out any serious operations in a maritime war, the first thing necessary is to secure control of the sea, which can only be done by defeating the enemy's fleet, or rendering them powerless by blockading them in their military ports. Can we do this with the United States? It is evident to me that we can not. And even if God should grant us a great victory, against what may be reasonably expected, where and how could we repair the damage sustained? Undoubtedly the port would be Havana; but with what resources? I am not aware of the resources existing there; but judging by this department, where everything is scarce, it is to be assumed that the same condition exists everywhere, and that the immediate consequences of the first great naval battle would be the enforced inaction of the greater part of our fleet for the rest of the war, whatever might be the result of that great combat. In the meantime the enemy would repair its damages inside of its fine rivers, and aided by its powerful industries and enormous resources. This lack of industries and stores on our part renders it impossible to carry on an offensive campaign.

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"If the control of the sea remains in the hands of our adversaries, they will immediately make themselves masters of any unfortified port which they may want in the Island of Cuba, counting as they do on the insurgents, and will use them as a base for their operations against us. The transportation of troops to Cuba would be most difficult and the success very doubtful, and the insurrection, without the check of our army, which would gradually give way, and with the aid of the Americans, would rapidly increase and become more formidable.

"These reflections are very sad; but I believe it to be my unavoidable duty to set aside all personal considerations and loyally to represent to my country the resources which I believe to exist, so that, without illusions, it may weigh the considerations for and against, and then, through the Government of His Majesty, which is the country's legitimate organ, it may pronounce its decision. I am sure that this decision will find in all of us energetic, loyal, and decided executors. Our motto is 'The fulfilment of duty.'"

MORE DEFICIENCIES—THE COUNTRY MUST BE TOLD THE TRUTH.

On February 26th the Admiral wrote the following:—

"When I received yesterday the letter in which, among other things, you asked me if the "Colon" could go out for target practice, I answered that the vessel was ready, and at the same time I took measures so that the cartridge cases which might be used in that practice should be re-charged; but it appears that there is no furnace in which they can be re-annealed, or a machine to re-form the cartridge cases. The extra charges which the vessel brought (72 per gun) are therefore useless.

"I send to-day the official letter which I announced yesterday. Its conclusions are indeed afflicting; but can we afford to cherish illusions? Do we not owe to our country not only our life if necessary, but the exposition of our beliefs? I am very uneasy about this. I ask myself if it is right for me to keep silent, and thereby make myself an accomplice in adventures which will surely cause the total ruin of Spain. And for what purpose? To defend an island which was ours but belongs to us no more, because even if we should not lose it by right in the war, we have lost it in fact, and with it all our wealth and an enormous number of young men, victims of the climate and bullets, in the defence of what is now no more than a romantic ideal. Furthermore, I believe that this opinion of mine should be known by the Queen, and by the whole council of ministers."

That this thoughtful and patriotic advice was not favourably received by the Government is shown by the following letter a few days afterwards:—

"Yesterday I received your letter of the 28th, and I regret very much the painful impressions caused by my remarks; but I am not surprised, because they are truly sad, and still, perhaps, they fall beneath the mark, judging from everything one sees. Just now we have another proof of this in the fact that the difficulty of obtaining cartridge cases for the "Colon" arises from the want of means (money), and this on the eve, perhaps, of a war against the richest nation in the world. I do not wish to dwell too much on this point, for no practical result could be obtained, but every detail points out either our lack of means or our defective organisation, and, above all, our utter lack of preparation.

"I have deemed it my duty to express my opinions to the proper authorities clearly and without beating around the bush. Now let orders be given to me; I will carry them out with energy and decision. I am ready for the worst."

More Data Regarding Our Inferiority—Danger to the Philippines.

"An examination of our forces," said the Admiral on March 25th, "based upon what I already know and upon recent information and observation, not only confirms what I said, but shows it to be still worse. I have visited the "Vitoria," on which I counted, and from my visit I have drawn the conviction that we can not count on her for the present conflict. Neither does my information permit me to count on the "Pelayo," "Carlos V.," or "Numancia." And yet, as this opinion is not based upon personal observation, I include them in the enclosed statement. Whatever may be the direction given to the conflict, either war, negotiations direct, or through a third party, an arbitrator or otherwise, the longer the decision is delayed the worse it will be for us. If it is war, the longer it takes to come the more exhausted we shall be. If it is negotiation of any kind, the longer it is postponed the greater will be the demands, each time more irritating, which will be presented by the United States, and to which we shall have to yield in order to gain time in the vain hope of improving our military position. And as our position can not be improved, let us see what we can expect from a war under such conditions.

"It would be foolish to deny that what we may reasonably expect is defeat, which may be glorious, but all the same, defeat, which would cause us to lose the island in the worst possible manner. But even supposing an improbability, that is, that we should obtain a victory, that would not change the final result of the campaign. The enemy would not declare itself defeated, and it would be foolish for us to pretend to overcome the United States in wealth and production. They would recover easily, while we should die of exhaustion, although victorious, and the ultimate result would be always a disaster. Only in case we could count on some powerful ally could we aspire to obtain a satisfactory result.

"But, besides having to discount the high price to be paid for such an alliance, even then we should only be postponing the present conflict for a few years, when it would become graver than it is to-day, as is the present insurrection in comparison with the last."

Cervera Wished to Explain his Opinion to the Council of Ministers.

Admiral Cervera's already expressed desire to personally inform the council of ministers was still more clearly expressed under date of March 16th.

"Yesterday I received your favour of the day before, by which I see that our opinions agree concerning the conflict which threatens our unfortunate country. As both of us are animated by the best desires, such agreement was sure to come. It also appears that the whole Government participates in this opinion, but I am afraid that there may be some minister,

who, while believing that conditions are not as favourable for us as they might be, may yet have been dazzled by the names of the vessels appearing in the general statement, and may not realise how crushing a disproportion really exists, especially if he is not thoroughly aware of our lack of everything that is necessary for a naval war, such as supplies, ammunition, coal, etc. We have nothing at all. If this fear of mine is well founded, I think it is of the greatest importance that the whole council of ministers without exception be fully and clearly informed of our terrible position, so that there may not remain the least doubt that the war will simply lead us to a terrible disaster, followed by a humiliating peace and the most frightful ruin; for which reason it is necessary not only to avoid the war but to find some solution which will render it impossible in the future. If this is not done, the more time spent, the worse will be the final result whether it is peace or war.

"From this reasoning, as clear as daylight to me, it appears that since we can not go to war without meeting with a certain and frightful disaster, and since we can not treat directly with the United States, whose bad faith is notorious, perhaps there is nothing left for us to do but to settle the dispute through arbitration or mediation, provided the enemy accepts. However, this order of considerations does not come within my sphere of duty, which, as the chief of the squadron, is limited to reporting the state of naval affairs and then carrying out the orders of the Government. The latter, however, must be fully informed of the situation. Before dropping this subject, I must insist that perhaps it would be well for me to verbally inform the members of the Cabinet, and to say that I am ready to start at the first intimation.

"Concerning the available forces and what may be expected of them, I shall be very glad if Ansaldo carries out his promise about the 254-millimetre guns of the "Colon." The 14-centimetre cartridge cases are absolutely necessary. This vessel has only thirty, and it is to be supposed that the stores of the "Oquendo" and "Vizcaya" are not better supplied. For the present the firm is supplying only one hundred per week; and supposing that the first ones have already arrived or will arrive in Cadiz one of these days, at this rate we shall not have finished until October. Then they have to be charged, therefore they can never be ready in time for the present conflict. I thought I should have the first ones by January, but I shall not have them until April. The engines of the "Pelayo" are ready and the vessel can sail, but how about the secondary battery and the armoured redoubt? These will not be ready. If the old battery could be mounted! But I doubt it; the ports will not permit it. I have heard it said that the crew which brought the "Pelayo" was taken from the "Vitoria," which is another proof of our excessive poverty. It will be very well if the "Carlos V." is soon ready, but I understand that the 10-centimetre battery has not yet been mounted, and then the trials have to be made.

"I never had great confidence in the purchasing of vessels. Too much fuss is made over every detail by ignorant people. It was through this that we lost the "Garibaldi," and now we have lost the Brazilian

cruisers. In fact, we have only secured the "Colon," an excellent ship, but which has not yet arrived, and the "Valdes." And supposing that we had everything our own way, and that Providence should grant us a victory, which is highly improbable, we should then find ourselves in the condition explained in my last, and which it is not necessary to repeat. It only rests for me now to be informed of the destination of the fleet. I believe the "Teresa" ought to be in Cadiz, where the cartridge cases are to be recharged, and she could sail as soon as all her guns were mounted.

"I will insist no more, but the voice of my conscience, animated by my love for my country, tells me that in saying this I am fulfilling my unavoidable duty."

Condition of the Fleet Immediately Before the War.

In the month of April, shortly before the war, Cervera wrote:—

"My fears are realised. The conflict is coming fast upon us; and the "Colon" has not received her big guns; the "Carlos V." has not been delivered, and her 10-centimetre guns are not yet mounted; the "Pelayo" is not ready for want of finishing her redoubt, and, I believe, her secondary battery; the "Vitoria" has no guns, and of the "Numancia" we had better not speak.

"But after all I am glad the end is coming. The country can stand this state of affairs no longer, and any arrangement will be a good one, however bad it looks, if it comes without our having to lament a great disaster, as may happen if we go to war with a few half-armed vessels, and without want of means and excess of incumbrances."

A few days afterwards he wrote:—

"On account of the general anxiety it is very important to think of what is to be done, so that, if the case arises we may act rapidly and with some chance of efficiency, and not be groping about in the dark, or like Don Quixote, go out to fight windmills and come back with broken heads.

"If our naval forces were superior to those of the United States, the question would be an easy one. All we should have to do would be to bar their way. But, on the contrary, our forces are very inferior to theirs. To endeavour to bar their way, which could only be done by giving them a decisive naval battle would be the greatest of follies. That would simply mean a sure defeat, which would leave us at the mercy of the enemy, who would easily take a good position in the Canaries, establish there a base of operations, crush our commerce, and safely bombard our maritime cities. It is therefore absolutely necessary to decide what we are going to do, and without disclosing our proposed movements, be in a position to act when the time comes.

"This was the substance of my telegram, and my ideas have not changed since then. If we are caught without a war plan, there will be vacillations and doubts; and, after defeat, there may come humiliation and shame."

On the eve of the war Cervera justly lamented the lack of a plan as follows:—

"I regret very much to have to sail without having agreed upon some plan, even in general lines, for which purpose I repeatedly requested permission to go to Madrid. For the bulk of the telegrams received I think I see that the Government persists in the idea of sending the little squadron (torpedo-boat flotilla) to Cuba. That seems to me a very risky adventure, which may cost us very dear, for the loss of our flotilla and the defeat of our squadron in the Caribbean Sea entail a great danger for the Canaries, and perhaps the bombardment of our coast cities. I do not mention the fate of the Island of Cuba because I have anticipated it long ago. A naval defeat would only precipitate its ultimate loss, while if left to defend itself with its present means, perhaps it would give the Americans some annoyance. We must not deceive ourselves concerning the strength of our fleet. If our correspondence of the last two months is looked over it will be seen not that I have been a prophet, but that I have fallen short of the true mark. Let us not have any illusions as to what we can do."

The last documents relating to the sailing of the fleet from Cape Verde are the most interesting. They show what was the condition of the vessels on the 19th April, the day before the rupture of relations. Admiral Cervera wrote from Saint Vincent, Cape Verde:—

"The boilers of the "Ariete" are practically out of service, so that this vessel, instead of being an element of power, is the nightmare of the fleet. She could only be used for port defence. The boilers of the "Azor" are eleven years old, and are of the locomotive type. As for the "Furor" and "Terror," their bow plates give as soon as they are in a sea-way, and some of their frames have been broken. The "Pluton" had an accident of this kind when coming from England, and had her bows strengthened at Ferrol."

"I have just now been informed that the "Vizcaya" and "Oquendo" are in sight. I have had the pleasure of seeing them come in and of greeting their captains. The crews are in the best of health and spirits, but the "Vizcaya" needs docking badly. During the trip from Puerto Rico she burned 200 tons more than the "Oquendo," which means a diminution of her speed of from 3 to 5 knots according to my reckoning, and a diminution of her sphere of action of from 25 to 35 per cent., thus losing the advantage of speed. Both are now coaling, but it is a long job, for, unfortunately, we do not feel at home here. We are indeed unlucky!"

Council of War of the Commanders.

It is well known that before the sailing of the squadron the commanders of the vessels held a council of war on board the "Colon," on April 21st.

This is what Cervera wrote:—

"The council lasted nearly four hours. The prevailing spirit was of the purest discipline, characterised by the high spirit which animates the whole fleet, and especially the distinguished commanders who are an

honour to Spain and the Navy, and whom it is my fortune to have as companions in these critical circumstances. The first and natural desire expressed by all was to go resolutely in quest of the enemy, and to surrender their lives on the altar of the mother country; but the vision of this same mother country abandoned, insulted, and trod upon by the enemy, proud of our defeat—for nothing else can be expected by going to meet them on their own ground with our inferior forces—forced them to see that such sacrifice would not only be useless but harmful, since it would place the mother country in the hands of an insolent and proud enemy, and God only knows what the consequences might be. I could see the struggle in their minds between these conflicting considerations. All of them loathe the idea of not going immediately in search of the enemy and finishing once and for all. But, as I said before, the spectre of the country violated by the enemy rose above all other considerations, and, inspiring themselves with that courage which consists in braving criticism and perhaps the sarcasm and accusations of the ignorant masses, which know nothing about war in general and naval warfare in particular, and which believe that the "Alfonso XIII." or the "Cristina" can be pitted against the "Iowa" or "Massachusetts," they expressly and energetically declared that the interests of the mother country demanded this sacrifice from us.

"One of the captains had certain scruples about expressing his opinion, saying that he would do what the Government of His Majesty should be pleased to order; but as all of us, absolutely all, shared these sentiments—it is hardly necessary to say—his scruples were soon overcome. Another of the captains, certainly not the most enthusiastic, but who may be said to have represented the average opinion prevailing in the council, has written, by my order, his ideas, which reflect, better than I could express them, the opinions of all. This document exactly expresses the opinion which prevailed in the meeting.

"An act was signed in which it was stated that, having met by order of the commander-in-chief and under his presidency, the second in command and the captains of the vessels, the president submitted to discussion the following point:—

"'Under the present circumstances of the mother country, is it expedient that this fleet should go at once to America, or should it stay to protect our coasts and the Canaries, and to provide for any contingency?'

"Several opinions were exchanged concerning the probable consequences of our campaign in the West Indies; the great deficiencies of our fleet compared with that of the enemy were made manifest, as well as the very scanty resources which the islands of Cuba and Puerto Rico are able to offer for the purpose of establishing a base of operations. In consideration of this, and the grave consequences for the nation of a defeat of our fleet in Cuba, thus leaving unobstructed the coming of the enemy against the Peninsula and adjacent islands, it was unanimously agreed to call the attention of the Government, by means of a telegram, in which the commander-in-chief of the squadron, in agreement with the

second in command and the commanders of the vessels, suggested to go to the Canaries. The "Ariete"—it said—boilers in bad condition, those of the "Azor" very old, "Vizcaya" needs docking to paint bottom if speed is to be maintained. Canaries would be protected against a rapid descent of the enemy, and all the forces would be in a position, if necessary, promptly to come to the defence of the mother country."

Opinion of Señor Concas.

The opinion of Captain Victor M. Concas, commander of the battle-ship "Infanta Maria Teresa," concerning the subjects presented for discussion by the admiral of the fleet at the council of war held on board the "Cristobal Colon," was as follows:—

"1. That the naval forces of the United States are so immensely superior to our own in number and class of vessels, armour and guns and in preparations made—besides the advantage given them by the insurrection in Cuba, the possible one in Puerto Rico, and the one still existing in the East—that they have sufficient forces to attack us in the West Indies, in the Peninsula and adjacent islands, and in the Philippines. That since no attention has been paid to that archipelago, which was perhaps the most urgent, in order to reduce our vulnerable points, and which could have been done with a single battle-ship, to-day any division of our limited forces and any separation from European seas involves a strategic mistake which would bring war to the Peninsula, a frightful disaster to our coasts, the payment of large ransoms, and perhaps the loss of some island. As soon as this fleet leaves for the West Indies it is evident—as has happened already more than once (*sic*)—that the American flying squadron will sail for Europe; and even if its purpose was only to make a raid or a demonstration against our coasts, the just alarm of all Spain would cause the enforced return of this fleet, although too late to prevent the enemy from reaping the fruits of its easy victory.

"The only three vessels of war remaining for the defence of the Peninsula, the "Carlos V.," the "Pelayo," whose repairs are not yet finished, and the "Alfonso XIII.," of very little speed, are not enough for the defence of Spain, and in no way for that of the Canaries. The yacht "Giralda" and the steamers "Germania" and "Normania" are vessels of no fighting qualities and add no strength to our Navy.

"2. The plan of defending the Island of Puerto Rico, abandoning Cuba to its fate, is absolutely impossible, because, if the American fleet purposely destroys a city of the last-named island, in spite of all the plans of the Government upon the subject, and even if it should be the maddest thing in the world, the Government itself would be forced by public opinion to send this fleet against the Americans, under the conditions and at the point the latter might choose.

"3. Even deciding upon the defence of Puerto Rico alone, the trip across to-day, after the practical declaration of war, without a military port where the fleet might re-organise itself on its arrival, and without an

auxiliary fleet to keep the enemy busy—who, I suppose, will make St. Thomas its base of operations—is a strategic error the more deplorable because there have been months and even years of time to accumulate the necessary forces in the West Indies. It seems probable, judging from the information acquired, that the supplies accumulated at St. Thomas are intended by the enemy to establish a base of operations in the vicinity of our unprotected Vieques (Vierges). For all these reasons the responsibility of the trip must remain entirely with the Government.

"4. Adding these three battle-ships and the "Cristobal Colon," without its big guns, to the two remaining in the Peninsula and to the few and old torpedo-boats which we have left, it is possible to defend our coast from the Guadiana to Cape Creus, including the Balearic and the Canaries, thanks to the distance of the enemy from its base of operations. This defence, however, will have to be a very energetic one if the enemy brings its best ships to bear on us.

"5. It is very regrettable that there are not enough vessels to cover all points at one time; but duty and true patriotism compel us to clearly express the resources which the country gave us, and the necessities which present circumstances bring on the country in danger.

"6. Lastly, I believe that the military situation should be made known to the Minister of Marine, reiterating our profoundest subordination to his orders, and our firm purpose most energetically to carry out the plans of operations he may communicate to these forces. But after pointing out the probable consequences, the responsibility must remain with the Government."

From Cape Verde.

Finally, on April 22nd, the Admiral said:—

"It is impossible for me to give an idea of the surprise and astonishment experienced by all on the receipt of the order to sail. Indeed that surprise is well justified, for nothing can be expected of this expedition except the total destruction of the fleet or its hasty and demoralising return; when here in Spain it might be the safeguard of the nation.

"You talk about plans, and in spite of all my efforts to have some laid out, as it was wise and prudent, my desires have been disappointed. How can it be said that I have been supplied with everything I asked for? The "Colon" has not yet her big guns, and I asked for the bad ones if there were no others. The 14-centimetre ammunition, with the exception of about 300 shots, is bad. The defective guns of the "Vizcaya" and "Oquendo" have not been changed. The cartridge cases of the "Colon" can not be recharged. We have not a single Bustamante torpedo. There is no plan or concert, which I so much desired and called for so often. The repairs of the servomotors of the "Infanta Maria Teresa" and the "Vizcaya" were only made after they had left Spain. In short, this is already a disaster, and it is to be feared that it will be a more frightful one before long. And perhaps everything

could be changed yet! But I suppose it is too late now for anything that is not the ruin and the desolation of our country.

"The "Vizcaya" can no longer steam, and she is only a boil in the body of the fleet.

"But I insist no more. The act has been done, and I will try to find the best way out of this direful enterprise."

The following are the last letters we know of:—

"SAINT VINCENT (CAPE VERDE), *April 24th, 1898.*

"I have just received the telegram ordering us to start, and I have given orders to tranship from the "Cadiz" to these vessels coal, supplies, crews, and the guns of the destroyers, which was on board the "Cadiz."

"I intended to sail without finishing the provisioning of the vessels, but since the "Cadiz" is to stay I have decided to ship as much coal as possible. I shall try to sail to-morrow.

"As the act has been consummated, I will not insist upon my opinion of it. May God grant that I be mistaken! You see I was right when I said that by the end of April the "Pelayo," "Carlos V.," "Vitoria," and "Numancia" would not be finished; the "Colon" would not have its big guns, unless we took the bad ones, and we would not have the new 14-centimetre ammunition with which to fight, etc.

"With an easy conscience I go to the sacrifice, but I can not understand that decision of the Navy general officers[1] against my opinions.

"I have been informed of the sailing of a cargo of coal for Puerto Rico, where it is supposed to arrive on the 11th or 12th May, but I am afraid lest it should fall into the hands of the enemy.

"It is a mistake to suppose that I can accept or avoid a naval battle at will. The "Vizcaya," on account of her stay in Havana and the nine months without cleaning her bottom, is nothing but a buoy, and I can not abandon her."

ONE TELEGRAM FROM VILLAAMIL.

"AT SEA, *May 5th, 1898.*

"DEAR JUAN: To complete our collection of documents, I think you should have the enclosed copy of a private telegram from Villaamil to Sagasta. I send you this letter by means of two destroyers which I am sending to Martinique in search of news. All is well on board, and the spirit is excellent. We shall see what God has in store for us. The final result is not doubtful, but if only we could start with a good lucky stroke! God be with us! Good-bye. Regards to your folk, etc.

"PASCUAL" (Cervera's first name).

[1] In a council of eighteen general officers, fourteen voted for the immediate sailing of Cervera's fleet from the Cape Verde. Generals Gomez, Imaz, and Lazaga voted against it until the reinforcement of the fleet by the "Pelayo," "Carlos V.," "Alfonso XIII.," and "Lepanto," and the three destroyers remaining in the Peninsula. Generals Butler and Mozo shared this opinion conditionally, subordinating it to the decision of the Government.

[Copy of Telegram.]

April 22nd, 1898.

"PRAXEDES SAGASTA, *Madrid:*

"In view of importance to the country of destination of this fleet, I deem it expedient you should know, through a friend who does not fear censure, that, while as seamen we are all ready to die with honour in the fulfilment of duty, I think it undoubted that the sacrifice of these naval forces will be as certain as it will be fruitless and useless for the termination of the war, if the representations repeatedly made by admiral to minister of marine are not taken into consideration.

"F. VILLAAMIL."[1]

[1] Rear-Admiral Villaamil was Admiral Cervera's second-in-command; he was killed at the battle of Santiago.

PHYSICAL EXERCISES IN RUSSIAN CADET SCHOOLS.

Translated from the "Voïénnyi Sbórnik."

THE curriculum of Russian Cadet Schools includes some subjects which are not generally to be found among those taught in military institutions, but as these are of long-standing they are likely to retain their place. These are music, singing, dancing, and manual work. Singing especially has been in vogue ever since such schools existed, the primary object of it being to supply choirs for the chapels and the performance of vocal music on state occasions, though it has only become obligatory since the sixties. Music is still optional, those who show no capacity for it being encouraged all the more in manual work. Besides drill and military exercises and gymnastics, games, fencing, and swimming form an organised part of the course. Dancing occupies an hour a week. The senior classes only practise fencing, having two lessons a week. Three hours are devoted to music or manual work, two to singing, and one to dancing. Drill occupies one or two hours in the week and gymnastics from three and a half to four and a half hours. Swimming is practised every day during the summer months as far as possible, the seniors receiving a regularly organised method of instruction. Games are encouraged during playtime but also form part of the course under the heading of gymnastics. At least one and a half hours every day are devoted to systematic physical exercises. These were originally introduced from Sweden, but are no longer very rationally conducted, the form of the system having been retained while the spirit has been lost.

The question whether, in the system of exercises, the first place should be given to gymnastics proper or to games has been decided by the authorities as in France. We quote the dictum of Professor Marey, president of the commission appointed in that country:—*La vérité, comme il arrive presque toujours, se trouve entre les deux systèmes, et la solution du problème consiste à emprunter à chacun d'eux ce qu'ils ont de meilleur, à les combiner en les débarrassant de ce qu'ils ont d'excessif ou d'arbitraire.* Consequently games have found a very large place in the programme of the Cadet Schools. As regards gymnastics proper, it has been the object of the authorities to avoid carrying them to excess and also to exclude such exercises as have no practical utility. The principle laid down is that the purpose to be kept in view is not merely the development of strength and capacity for increased but transitory exertion, so much as the creation of an exact and involuntary co-ordination of movements and endurance—in other words, the capacity for continued exertion. No part must be developed except in as far as it advances the general development and is in accordance with the natural functions of the whole organism. From the

moral point of view, beside the feeling of contentment which sufficient and well-calculated, but not excessive, physical exertion excites in a man, the object is to cultivate self-confidence and decision, and to harden the pupil against excessive sensitiveness, to physical privations and suffering and ensure that inward equilibrium, the attainment of which is one of the most important problems of education at the present day.

The gymnastic exercises which are in use are divided into those without apparatus, those with movable apparatus, on fixed apparatus, and field gymnastics (*exercices dans la piste avec obstacles*, or *exercices dans la lice*). The latter are confined to the senior classes when in camp, and the obstacles set up are the same as those for soldiers, only of somewhat smaller dimensions. The juniors have three lessons a week, the seniors two, each lesson lasting 50 minutes. Besides the regular gymnasium attached to every such institution, there is an apparatus in all the court-yards, and 5° Réaumur below zero is not considered too low a temperature for practice in the open air. This is never carried on either immediately before or after a meal, at least an hour being allowed to elapse in the latter case. The lesson begins with exercises without apparatus, and ends with running and marching. The first 10 to 15 minutes are devoted to exercises without apparatus, 20 to 25 minutes on fixed apparatus, and the remainder to running and marching. This is occasionally varied by exercises with clubs. In the two junior classes less time is necessary for running and the use of the fixed apparatus. The time thus gained is given to such games as can be readily started, and do not take up more than a few minutes. The officer who acts as instructor is assisted by the best gymnasts in the senior class, or monitors as they are called, specially trained for the purpose, selected from the soldiers attached to the school. Linen shirts are worn when these exercises are in progress. In order to ensure a methodical training the instructor keeps a book, in which he puts down the progress made and any remarks he finds necessary. Where especial attention is required on account of some physical peculiarity, the surgeon attached to the establishment is called in to supervise. Besides the regular lessons at the end of the studies for the day some 15 or 20 minutes are given to simple exercises, so as to take the stiffness out of the pupils' joints after so much sitting.

The common objections to gymnastics are that they are tiring and tedious. Yet there are numerous societies in Germany and Sweden for the practice of them, so that the tedium must lie in the way the instruction is given. If the teacher believes in his work, is energetic and cheerful, and has the necessary technical skill and qualifications, and can excite emulation among his pupils, he can make gymnastics as interesting and pleasant as any other form of exercise.

We have yet to deal with the games in use. These include wrestling by teams, tug-of-war, various games of ball, throwing, archery, etc. In winter, lessons are given in sledging, the use of snow-shoes and tobogganing, while snow-balling and the making of snow figures and fortifications are encouraged. The instructor has to see that the "form," as

we should call it, is good and that certain rules are strictly observed. All games have to be played out, and not dropped at the pleasure of the players. The pupils are not restricted to these hours for their play, but have at least one hour and a half between the conclusion of the hours of study and dinner-time. When in camp the seniors have three hours consecutively for play once a week. The regulations "recommend" that the senior classes should hold regular sports several times a year, prizes being given and a certain ceremony observed. The sports are to include flat racing, obstacle races, throwing at a mark and distance-throwing with a ball and a lance, archery, rifle-shooting, tennis, and foötball.

In the choice of games preference is given to those in which the largest number of players can take part. The result of all this encouragement has been that athletics have greatly increased in popularity, and where, as is the case in the provinces, the schools have large grounds attached to them, the pupils spend almost all their spare time in such games.

The "sportsman" instinct is, however not encouraged, as tending too much to specialisation and to over-exertion. Though sport tends to increase doggedness and endurance, yet it is considered by the authorities to foster less desirable qualities, such as an excessive fondness for play, egotism, partisanship, and want of consideration for an opponent. Also the fondness for expensive paraphernalia and eccentric costumes thus inculcated are "not in accordance with the spirit of noble simplicity and moderation which are the noblest ornament of a strong and manly nature."

Swimming is a compulsory subject in the senior classes and is taught on a regular system, and includes swimming on the breast and back, and high and long diving. All the provincial schools have their own baths, fitted with all the necessary appliances. At Kiev there is a large artificial basin adjoining the hot baths where swimming lessons can be given even in winter. The results are on the whole satisfactory, and at those schools which lie along the great water-sheds the pupils are all skilled and untiring swimmers. Wherever possible they are taught rowing as well.

The fencing is confined to elementary lessons in the use of the foil. The system adopted is that at present in use in France, the Gomard-Prévost. It is rather for its qualities in developing agility and a quick eye than for any practical use that it is included in the course. Dancing is taught in all the classes, but in the two lower ones it more resembles calisthenics than a drawing-room accomplishment. The polonaise, the minuet, and the Russian national dance are the only ones practised. In the middle classes newer dances are studied, the polka, two and three time waltz, mazurka, the lancers, and French country-dance; I say studied, because they are not practised in the drawing-room sense. In the two senior classes they are properly taught to dance, mainly with a view to avoiding private teachers of doubtful morals.

Drill is mainly confined to the senior companies, which are taught regular company drill with the rifle in camp. In the junior classes the

instruction is confined to such elementary matters as standing at attention, wheeling, changing formation, and saluting. However, the carriage of the pupils is exceedingly good, and the small amount taught is an excellent supplement to the gymnastic training.

Class-singing is obligatory on all pupils throughout the seven years' course, except when their voices break. In the junior classes the elements of theory are also taught. Voice-production is attended to, and is found very essential, as many of the pupils up to the time of their joining have never been taught to make use of such voice as they have. Of course, anything like professional training is not attempted, only the cultivation of the voice as one of the parts of the body. There is a choir in every school, which sings in the chapel, and receives a more thorough and finished instruction. Those who have an aptitude for music are taught various instruments at their own request, and every school has its orchestra both of wind and string instruments; and with this and the choir, concerts can be given, though they are not public, nor would a charge for admission be allowed. The musical taste thus encouraged serves to fill up the young men's leisure when they become officers, and sometimes you may find in a regiment a whole amateur orchestra.

Manual work is optional and is mainly taken up by those who do not go in for extra singing or instrumental music. The instruction is on Otto Salomon's Swedish system, but the models are, of course, changed to suit a secondary instead of a primary school. The elementary course is in wood-work, and is, as a rule, for the five lower classes. In the two higher the pupils are allowed to work at what they please, and are also given elementary instruction in working metal. The work is very popular and the seniors often turn out gymnastic apparatus and school furniture, though no use is ever made of their work in the establishments. They are not allowed to exhibit it, still less to sell it. The object of the work is not to develop the physical qualities of the pupil, but to give him an interest in one side of human activity which is commonly neglected among the higher classes. Even the use of the axe, which at first sight would seem to demand great and varied skill, is no exception to this rule. The Russian Cadet Schools stand almost alone in paying attention to "technical education" in this way.

There are courses of physical education for officers intending to be instructors at these schools. These last from the 1st June to the 20th August in each year. They include brief summaries of anatomy, physiology, and hygiene, and the theory and history of physical exercises. The practical part consists of gymnastics, fencing, manual work, and swimming, and also the method of instruction. Officers who make a special subject of fencing attend two courses, and there are also practical classes for them during the winter at St. Petersburg and Moscow. The advantage of having instructors who thoroughly understand their business and also men of intelligence has been amply demonstrated during the last 10 years. It is hoped that this brief sketch may tend to the better understanding of the methods pursued by the great military Power of the East.

MILITARY EDUCATION IN AUSTRIA.

Translated from the "Voïénnyi Sbórnik."

MILITARY schools in Austria-Hungary are of two kinds, preparatory and professional. The former include four *Militär-Unter-Real-Schulen* with a 4 years' course, and an *Ober-Real-Schule* with a 3 years' course, the latter two *Militär-Academien* with a 3 years' course, and seventeen cadet schools with a 4 years' course. The ordinary run of a military education is that a boy of 10 or 11, after passing through a "Volksschule" or what corresponds to it, goes to the *Unter-Real-Schule* for 4 years, and after attaining the first standard in it goes to an *Ober-Real-Schule* for 3 years, and then spends 3 years more at a military academy, after which he is appointed an officer. Thus his whole education lasts 10 years. Boys who only reach the second standard at the *Unter-Real-Schule* go to a cadet school for 4 years, and are then appointed to regiments as junker, and promoted to be officers at the end of a year, thus obtaining that rank a year sooner than their more studious comrades. All classes of the institutions enumerated can be entered by examination showing an equivalent standard of knowledge, except the first class in the military academies.

Of the whole twenty-four, three only are situated in Vienna itself, and these only pending the accumulation of the necessary funds for taking them outside the capital. All the others are in less thickly populated towns, and always outside the boundaries of them. The *Ober-Real-Schule* at Weisskirchen, and the Military Academy at Wiener Neustadt, stand in the centre of huge parks some 5 miles in circumference. Thus the pupils have plenty of fresh air, and are not confined to a sort of playground as in many countries. They have grounds for lawn-tennis, skittles, and various games of ball, bathing places, seats, and summer-houses within easy reach among flower and fruit gardens.

The actual buildings, on the other hand, are not so well designed. Most of them are old castles, picturesque enough, but not very skilfully converted into educational establishments. There is a great lack of space both in the living and class rooms. The reception rooms and infirmaries are too close to the students' quarters, and there is no means of isolating infectious disorders, the lighting is mostly gas, and in many places there are no extension tubes. Yet the percentage of sick, 5 per cent. in the year, must certainly be considered small.

The teaching staff is exclusively military, with the exception of the teachers of divinity, and in certain cases of singing. The instructors are not allowed to give private lessons, and all live on the premises, and are

expected to act as tutors as well. Any officer can apply to be so employed, and when the authorities have made enquiries as to his record at the academy with regard to his special subject he gives a trial lecture, and is then appointed instructor, and in most cases tutor as well. Only 5 per cent. have passed through a higher educational establishment, while 15 per cent. have been invalided, and the remainder are officers on the establishment seconded for the purpose for 5 years and no more. The latter receive extra pay at the rate of 16 gulden a month, the permanent teachers an increase of 8 gulden per month every 5 years. It is not surprising that many of them are very imperfectly acquainted with the subjects they profess to teach, but on the other hand they are in thorough touch with their pupils, look after their preparation, and maintain admirable discipline; take part in and excel in games, and in many cases give them military instruction as well—in fact, teachers and pupils form a military family as in a regiment. At the *Real-Schulen* the instructors are assisted by non-commissioned officers, who supervise, especially at night, which does not seem at all desirable. The pupils are divided into pensionnaires, semi-pensionnaires, and those who attend at their own expense, the latter not exceeding 25 per cent. Pupils are admitted much more on family or property considerations than on any display of knowledge at examinations. The governors of the schools and colleges will not take pupils of the Jewish faith, and the decision rests with them. There are no day scholars. The average age for receiving a commission is between 19 and 21. The pupils are not always robust-looking, but very smart in drill and gymnastics, and well set up. Their uniform is smart, simple, and easy. There is, however, an insufficiency of provision for warm baths, though the swimming-baths for summer are commodious, and are used every day.

The day is divided as follows:—The first thing in the morning before work begins there is from half to three-quarters of an hour of walking exercise, or in bad weather gymnastics of a light kind. Almost all the more difficult teaching is got over before dinner, which is about 1 o'clock, supper being about 8. The lessons last about an hour, with an interval of 5 minutes, and there are half-holidays on Wednesday and Thursday. The instructors help the pupils in the preparation of the more difficult lessons. There are two terms, winter and summer, during the latter of which much time is devoted to drill. No special time is set apart for religious exercises, but the pupils have to attend church every Sunday. In the *Ober-Real-Schulen* the hours of study are longer than in the *Unter*.

Among the subjects physics, chemistry, geography, and drawing occupy a large place. In addition to French, and of course German, either Hungarian, Bohemian, or Polish is obligatory, and fencing is laid great stress on. An hour a week is devoted to teaching deportment and the way to behave in society. An hour is given to singing, and one to practising various instruments, every school having an excellent orchestra composed of its own students. There are no examinations for promotion or on leaving, and a lad has only to pass through his classes with credit to ensure a commission at the end of the specified time. It is all a

question of certificates. There is a system of half-yearly marking by balls, 5 for first-rate, 4 for very good, 3 for good, 2 for satisfactory, 1 for unsatisfactory, 0 for bad. If a pupil gets marked "bad" twice in any single subject, he is dismissed. There are badges on the collar of the tunic showing what kind of certificate each has got. Many of the authorities consider the absence of examinations a great saving of time.

In gymnastics the results are excellent. After 2 or 3 years the young fellows become exceedingly skilful, jump well, and are able to carry each other. The fencing, both rapier and broadsword, is very good, the former being taught on the Italian system. The teaching is good, and the learning enthusiastic, the young men realising how essential such acquirements are to them. Much of their spare time is spent practising gymnastics on their own account. Riding is taught only in the two higher classes of the military academies, and the cavalry cadet school; the jumping and seat are good and the horses of a good class. Singing is a regular part of the curriculum, and the part-singing is excellent.

The dietary is as follows:—In the morning on the first getting up, soup in the schools, coffee in the academies; at 10 a large roll, sometimes with butter; at 1 dinner, consisting of three courses, soup, beef and compôte, and sweets; at 4 p.m. a roll; about 8 p.m. supper, roast beef. The cost of each pupil is 38 kreuzers at the Cadet School, 52 kreuzers at the *Unter-Real-Schulen*, 54 kreuzers at the *Ober*, and 70 kreuzers at the academies. All, except the junior schools, have what is called a "casino" where there are billiards, small tables, and a buffet, where tea, coffee, and comestibles are sold, and in the academies and cadet schools liquor as well. The poorer students are allowed about 3 gulden a week pocket-money. The holidays are—Christmas, 23rd December to 2nd January; Carnival, 20th to 23rd February; Easter, 7th to 12th April; and eleven saint's-days and holidays "by command of the Emperor"; or 29 days in all. There are also a summer vacation of two months, from July 1st to September 1st, at the schools, but the academies and cadet school have only from August 18th to September 20th, though after July 1st there is nothing but drill, as the money is not forthcoming for going into camp. Leave is only given on Sundays between dinner and supper except at Christmas, Carnival, and Easter.

There is a special school of military gymnastics and fencing at Wiener Neustadt, 1½ hours by rail from the capital, with a huge park attached to it. There are two courses there, the special and the ordinary. The former is conducted by two officers, assisted by two non-commissioned officers, and forty officers are chosen twice a year to attend it; it lasts 4 months. There are 22 hours a week for fencing lessons, 4 for gymnastics, and 2 for anatomy and hygiene.

For the ordinary course there are four officers and three non-comissioned officers as instructors, and it is attended every year by eighteen officers and twenty-one non-commissioned officers, mostly at their own request. It lasts 11 months and is intended for the training of instructors in gymnastics and fencing, which in this case includes the rapier. In winter 3½ hours a week are devoted to skating and the use of snow-shoes,

and 1½ to fire-quarters in the case of officers, while the non-commissioned have 4½ of arithmetic, calligraphy, and German, 2 of singing, and 1 of dancing. In summer there are 3 hours of fire-quarters, 3 of rowing, 3 of sailing, and 4½ of bicycling, with 2 of deportment, 3½ of German, calligraphy, and arithmetic, and 1½ of singing for the non-commissioned. As regards the results obtained in gymnastics, the pupils are taught to jump a stream 21 feet wide, and 5 successive earthen walls and obstacles of considerable height. A high four-storied tower of wood is used for the fire-brigade practice, from which they jump on to narrow strips of linen laid out below.

Unlike some of the foreign military schools, they do not allow the pupils to be herded together in large numbers in dormitories; but there are rooms of 10 or 13, where a certain amount of privacy is possible. The senior pupil in each room is responsible for order and tidiness. There is far more liberty as to the disposal of spare time, and as the teachers have to give all their attention to the pupils, and do no outside teaching, much better results are obtained, especially as regards general education and training. The great attention paid to games is no doubt due to the example of our own countrymen, with whom Austria has for some reason always been a favourite. Perhaps there is more similarity between the two nations than between us and any other on the Continent. It might not be unwise, if it were possible, to adopt their plan of qualifying examinations, and thus put a stop to the pressure of competition.

ENGLAND'S SICK SOLDIERS IN FLANDERS IN 1742-8.

By JOHN T. BRAMHALL.

Reproduced from the U.S. "Army and Navy Journal."

SIR JOHN PRINGLE, a famous physician of Edinburgh, and later physician to the Royal Family and president of the Royal Society, was appointed in 1742 physician to the Military Hospital in Flanders, England being at the time engaged in a Continental war over the Austrian succession. Sir John was an observing man, and wrote down his "Observations" for the benefit of the Edinburgh University, of which he was a professor, and these observations, published a year afterward, are an acknowledged authority on the subject. They were reprinted in German, French, and Italian, doing a wonderful service in the prevention of the terrible scourges which not only devastated armies, but depopulated countries after wars were concluded. Sir John Pringle was, indeed, the first eminent authority to discuss this important subject with the keen intelligence of a scientific mind. Few of the ancient historians made more than a passing mention of camp distempers and plagues, and then quite as a matter of course. Xenophon, in his relation of the famous retreat of the Greeks, observes that they were liable to blindness and to a mortification of the extremities, from the snow and the excessive heat to which they were exposed on their march.

Pliny is the first, the doctor asserts, to make mention of the scurvy, which afflicted the Roman Army in Germany (*Trans Rhenum maritimo tractu*, otherwise the Netherlands), after it had been two years in that country. Plutarch notes that Demetrius, in his last expedition, lost above 8,000 men by a sickness which followed a scarcity of provisions. Livy mentions a distemper that afflicted both the Romans and the Carthaginians in Sicily, and Diodorus describes another pestilence which almost destroyed the Carthaginians at the siege of Syracuse. He refers the final cause of this calamity to the gods, incensed against the people on account of their impiety, yet he explains the natural causes in a more full and satisfactory manner than was usually the case with the ancient historians. And if Sir Thomas had gone back to Homer (Pope's version had been given to the public some thirty-five years before) he would have found a notable illustration in the great plague in the Grecian camp which moved Achilles to call the council that decreed the restoration of Chriseis; a plague the origin of which is indicated in the opening lines:—

> "That wrath which hurl'd to Pluto's gloomy reign
> The souls of mighty chiefs untimely slain;
> Whose limbs unburied on the naked shore
> Devouring dogs and hungry vultures tore."

It has ever been the habit of poor, ignorant, superstitious man to attribute the result of his own shortcomings to the deity, as thus:—

"Latona's son a dire contagion spread
And heaped the camp with mountains of the dead;
The king of men his reverend priest defied,
And for the king's offence the people died."

So they have continued to die pretty much, ever since. But to return to Sir Thomas. After giving a topographical description of the country, where nature seems to have provided in the widely extended marshes and saturated soil a more complete defence against invasion than could be contrived by man, the doctor proceeds with his narration of events connected with the health of the Army in language as terse as a soldier's report.

In the beginning of June, 1742, the British troops began to embark for Flanders. There were in all, foot and cavalry, about 16,000. The winds were favourable, and several passages short, and the men landed in good health and went into their several garrisons. During the summer and autumn the weather was good, the heats moderate, and the country generally healthy. The British officers continued in good health (being well lodged), but many of the common soldiers sickened. Their illness was attributed by Sir John to their being quartered in the lower part of the town (mostly on the ground floors of waste houses, unprovided with drains, and of course damp). In July the sick of one battalion numbered about 140, out of a probable 740. Of these only two belonged to the companies quartered on the hill. In the middle of August, upon changing these unhealthful barracks, the sickness suddenly abated. There was much sickness among the troops at Bruges also, a town lower and moister than Ghent.

During the winter the army marched into Germany, leaving about 600 sick at the general hospital at Ghent. A flying hospital was opened at Nied (Wied ?), which in three weeks received 250 sick, the disease being almost entirely inflammatory. At Afshaffenburg another hospital was established, on a dry and airy field, and here 500 were left, the proportion of the sick to the whole being about 1 to 29. At Hanau a battle was fought, and the ground being wet and the weather hot, dysentery resulted, so that within eight days after the battle about 500 were seized with that distemper, and in a few weeks near half the men were ill, or had recovered of it.

The village of Feckenheim, a league from the camp, was employed for an hospital. Into this, during the stay at Hanau, beside the wounded about 1,500 sick were sent from the line, dysentery being the principal disease. The air soon became so vitiated that the other patients, the doctors, nurses, and others employed in the hospital, as well as most of the inhabitants of the town itself were infected. Hospital, or jail, fever followed, and the two combined occasioned a great mortality in the village as well as in the hospital. Dr. Benjamin Rush, who edited Sir John's volume, adds in a note that exactly the same mixture of initial diseases and hospital fever took place in

the military hospitals of the United States during the Revolutionary War. The fever was generally the result of too many patients being crowded together and of their being deprived of the means of cleanliness and of suitable aliments and drinks.

Removed to Worms and camping on dry ground the distemper largely disappeared. A new disease appeared, however, in an intermittent fever that increased as long as the troops kept the field. The army advanced to Spier, but returned to Worms in October. The weather was cold and rainy, and above 800 men were sent to the hospital with the fever. A general hospital being established at Neuwied the sick were removed from their several quarters and carried down the Rhine to that place, where, by the change of air those from Feckenheim were at first relieved, but the rest being mixed with them caught their infection, which circumstances rendered still more fatal. For orders coming to remove the sick to Flanders, where the army had already marched, they were embarked in bilanders (whatever sort of craft that may be) and conveyed by water to Ghent, where they did not arrive until the middle of December. During the voyage, the fever having acquired new force by the confinement of the air, by mortifications, and other putrid effluvia, it became so virulent that above half the number died in the boats and several of the remainder soon after arrival. No pen could depict the horrors of such a voyage, and the learned doctor does not attempt it, confining himself to the plain, unvarnished statement of fact. The proportion of men left in the hospitals at the end of the campaign to those who came safe into garrison was about 3 to 13.

In 1744 the British army took the field with some 26,000 men, and crossing the Scheld were fortunate in having good weather and good forage, so that in the first ten weeks' encampment only about 600 were sent to the hospital. The usual dysentery and intermittent fever followed, however, and by winter there were 1,500 sick in the hospitals, or "only the 17th part of all that took the field." The number of deaths did not exceed 300. The mildness of the season, the dry encampments, and frequent exercise, all concurred to preserve the health of the army, according to the very low standard of the time. At Bruges and Ghent the several regimental surgeons had orders to take care of their sick in barracks. This was for economy only, but it answered also the purpose of preventing infection, the common consequence of keeping great numbers of the sick together. This, Dr. Rush states, accords with the history of the small and large hospitals of the revolutionary army of the United States. When the campaign of 1745 ended there were about 1,000 sick, and the deaths by disease 200, on the whole, says Dr. Pringle, a most healthful campaign.

In the Scotch campaign of 1745-6, which the doctor followed, out of an army of some 13,000 men there were 2,000 in hospitals and 300 deaths, or above 17 per cent. of the whole, altogether.

At the end of the campaign in Dutch Brabant, 1746-7, there were in the hospitals from the main body of the British troops, above 4,000, exclusive of wounded, somewhat more than a fifth part of the whole

number. The four Zealand battalions furnished nearly half of the total, their sick in proportion to men fit for duty being near 4 to 1.

The beginning of the year 1748 was cold and rainy. The Low Countries suffered severely from inundations during the summer, which was very hot, followed by a close and foggy autumn. Fevers were severe in the marshy countries and in the cantonments in the forests, but less so in the higher and open camps and where the men had dry buildings. The peasants also were great sufferers from the fever, which they contracted from the presence of the invading army. It is unfortunate that the distinguished author makes no general summing up of the number of sick in the whole war, as compared with the number of men engaged; but we must remember that statistics did not then receive the attention that they do now, and Sir John appears to have given all the *data* at his command. The history of the close of the war was very similar to that of the close of our own short campaign in Cuba; the difficulties of weather and imperfect knowledge of hospital-ship requirements having much the same effect.

"About the middle of November, the peace being concluded, the troops moved from their cantonments to Willemstadt, and there embarked for England; but the wind being contrary, several of the ships lay above a month at anchor (!) and, after all, meeting with a tedious and stormy passage during which the men were kept mostly below deck. The air was corrupted and produced jail, or hospital, fever. This distemper was worst in the ships that transported the sick from the general hospital at Oosterhaut to Ipswich. The seeds of the disease already among them, and the men being crowded in the hold, where they were confined for three weeks, most of them were seized with this fever, either on board or soon after they landed. It was observable that the greatest number and the worst cases were in one of the ships which carried two men with mortified limbs, they not only spreading the infection at sea, but also in the wards in which they lay after they were put ashore."

It is to be inferred, though the author makes no allusion to the matter, that the chief hospital physician did all in his power to alleviate the horrors of the camp hospitals and the hospital ships. But this was before the days of the Red Cross and before the numerous discoveries in the art of medicine and improvements in the science of transportation. Dr. Pringle was a pioneer in the antiseptic treatment, and the soldiers in the Crimean and later wars, despite all the terrible suffering, profited greatly from his scientific observations, which extended to a much more thorough pathological history of the diseases of the camp than is hinted at in the above extracts.

If we were plunged in grief and indignation at the fact of 2,565 deaths from disease out of our army of some 200,000 men in our Cuban campaign, what shall be said of the fearful ravages of fever in the war of 1742-43, when the British troops were fighting in a land and climate not materially different from their own Lincolnshire, and with one of the best physicians in Britain as chief of the hospital staff?

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Vice-Admiral—Sir J. Fisher, K.C.B., to be Commander-in-Chief of the Mediterranean Squadron. Rear-Admiral—T. S. Jackson to be Admiral-Superintendent of Devonport Dockyard. Captains—R. L. Groome to be Commodore of the second class in command of south-east coast of America; G. N. Pollard to be Captain in charge at Ascension; M. P. O'Callaghan, C.B., to "Royal Sovereign"; R. S. D. Cumming to "Hermione"; G. A. Callaghan to "Endymion"; P. W. Bush to "Eclipse"; H. H. Dyke to "Empress of India"; G. M. Henderson to "Isis"; G. Le C. Egerton, C.B., to "Majestic"; A. A. C. Parr to "Asia"; R. F. Henderson, C.B., to be Captain-Superintendent of Sheerness Dockyard; A. Barrow to "Prince George"; W. L. H. Browne to "Severn"; T. Macgill, C.B., as Captain in charge at Bermuda; W. Marrack to "Indus"; R. F. O. Foote, C.M.G., to "Repulse"; G. C. Langley to "Nile"; W. S. Rees to "Thetis"; C. Campbell, C.B., D.S.O., to "Wildfire," as Flag-Captain, Sheerness; H.S.H. Prince Louis of Battenberg, G.C.B., to be an Assistant Director of Naval Intelligence. Commanders—D. A. Gamble to be Naval Attaché in Europe; C. H. Dare to "Blonde."

The first-class cruiser "Endymion" commissioned at Chatham on the 8th ult. for China, and left on the 20th ult. for her destination, where she will relieve a sister ship, the "Grafton." The third-class cruiser "Pallas" arrived at Portsmouth on the 6th ult. from North America and the West Indies, and was paid off on the 28th ult. The first-class belted cruiser "Immortalité" arrived at Plymouth from the China station on the 4th ult., and will pay off at Portsmouth, where her sister ship the "Narcissus," also from China, paid off on the 23rd ult. The second-class cruiser "Astræa," commissioned at Chatham on the 15th ult. for the Mediterranean, and left on the 27th ult. for her station. The second-class cruiser "Fox" arrived on the 14th ult., from the Cape of Good Hope, at Portsmouth, where she will pay off; she averaged 12·8 knots on the way home, which rate proved to be her most economical speed. The second-class cruiser "Intrepid" arrived at Portsmouth on the 20th ult. from North America and West Indies, and will pay off at that port. The first-class cruiser "Edgar" left Portsmouth on the 12th ult. for Malta with supernumeraries, and on her return is to be paid off. The screw-sloop "Basilisk" paid off at Sheerness on the 3rd ult.

Launch.—The third-class cruiser "Pioneer" was floated out at Chatham on the 28th ult. Her keel was laid on December 16th, 1897. She is of the "Pelorus" type, but somewhat modified and improved in accordance with the experience gained from the earlier vessels of the class.

Her dimensions are as follows:—Length between perpendiculars, 305 feet; beam, extreme, 37 feet; draught of water, forward 12 feet, aft 15 feet; displacement, 2,215 tons. She is to be fitted with four cylinder inverted, vertical, triple-expansion engines, and eight boilers of the Thornycroft water-tube type. The I.H.P. is to be 7,000, and the speed anticipated with this power is 20 knots. The engines are being made by the Fairfield Company of Glasgow. She will have a coal stowage at normal draught of 450 tons, and carry 224 officers and men. Her armament is to consist of eight 4-inch Q.F., eight 3-pounder Hotchkiss guns, and three ·45-inch Maxims. The conning-tower is armoured with 3-inch nickel steel. Further protection is given by deck-plating as follows:—Amidships, two thicknesses of ½-inch armour on the flat and two thicknesses of 1-inch on the slopes; at the ends of the vessel two thicknesses of ¼-inch steel on the flat and two thicknesses of ⅜-inch steel on the slopes. The weight of the vessel at the float out was 1,500 tons. The new cruiser will be able to store 540 tons of coal—400 tons in the upper bunkers on the protective deck and 140 tons in the lower bunkers abreast the machinery.

Night Signalling in the Mediterranean.—As in the case of other ships on this station, the battle-ship "Devastation," port-guard-ship at Gibraltar, has lately been fitted with Captain Percy Scott's flashing arrangement for night signalling. The apparatus consists of a series of narrow shutters (or a Venetian blind would perhaps better describe it) in a frame fixed to the front of the search-light projector, which is removable at will, and with the greatest ease. Flashing signals, which can be distinctly seen at a distance of over 20 miles, can now be made with the utmost rapidity without any fear of an error occurring, being a great advance over the old system of breaking the ray by means of a small disc placed inside the projector and worked from a lever on the outside. The new flasher referred to is also worked by a lever, the shutters opening and closing, and exposing and obscuring the light in a very effective and rapid manner.

Admiral Sir J. O. Hopkins, the Commander-in-Chief, some time since ordered that Captain Scott's invention should be used in the ships on the station, and after an exhaustive trial great satisfaction has resulted. The flasher is also used over the projector, when a group of incandescent lamps is fixed inside in lieu of carbons. This light, which is known as a "cruiser light," is decidedly effective, and has been fitted to all cruisers on the station.

The "Devastation" has also been fitted with Captain Scott's modification of the hand-flashing lamp, which is also constructed on the Venetian blind system; the blind or shutter, fitted to the front of the hand lamp, being worked by keys as in a telegraph instrument, the connection with a magnet of sufficient power to rapidly operate the shutters. This is also a most efficient arrangement, and what was practically a useless lamp for modern requirements has become of the greatest utility.

During the year ended 30th March the results of the competitions held in night signalling on the Mediterranean station were as given in the annexed table; and the results of the competitions in which ships passing through the station and those recently joined will be found in the second table. The competitions to June, 1898, consisted of 90 groups at 7·5 per minute for signalmen and signal ratings above, and for signal boys 60 groups at the rate of 6 per minute. After that date the competitions were reduced to 50 groups only, but at the same rate per minute respectively. In the case of the October competition, which shows a decreased percentage as compared with the June competition, it should be explained that several new ships took part, which will account for the percentage decreasing instead of increasing.

TABLE I.
Ships belonging to the Station.

Date.	No. of ships competing.	No. of ratings competing.	Percentages correct.				Average of Ship.
			P.O.'s.	Q. Sigl.	Sigl.	Boys.	
March, 1898 ...	20	145	93·0	91·0	75·0	89·2	88·4
May	12	86	92·5	90·2	80·2	75·6	88·1
June	17	189	95·1	92·2	85·8	88·7	92·2
October	29	225	92·6	89·4	79·8	92·8	89·3
March, 1899 ...	28	220	95·7	93·0	87·4	89·2	93·0
Jan.-March, 1899 ... ("Vulcan" course)	11	136	96·1	94·8	90·5	91·4	94·2

TABLE II.
Ships passing through and recently joined.

Orlando	7	83·6	85·2	86·2	86·8	85·6
Terrible	9	7·45	80·1	87·2	—	79·0
Aurora...	5	85·6	72·0	76·4	—	78·0
Edgar	3	67·2	59·2	—	—	62·1
Theseus	7	75·4	48·2	—	—	55·9
Pylades	2	—	—	59·2	—	59·8

These averages include three backward exercises for the "Orlando," one for the "Terrible" (special), two for the "Aurora," and two for the "Edgar." Backward exercises are made at the rate of 6 to 6·5 per minute, and special backward exercises at the rate of 5 per minute.—*Naval and Military Record* and *Times*.

Steam Trials.—The two new second-class cruisers "Hermes" and "Highflyer," both built by the Fairfield Shipbuilding firm on the Clyde, have concluded their trials satisfactorily. These two vessels are the latest types of the "Venus" class, but are supposed to embody some improvements over the earlier ships, although practically their dimensions are the same, which are as follows :—Length between perpendiculars, 350 feet ; beam, extreme, 54 feet ; displacement, 5,600 tons. There is a cellular bottom extending the full length of the engine and boiler spaces, and before and abaft these the water-tight flats of the magazines, etc., continue the double bottom right to the stem and stern. Under the protective deck, the side compartments for the full length of the boiler space are utilised for stowing coal. The hull is sub-divided by longitudinal and transverse bulkheads into numerous water-tight compartments as usual, the number of water-tight doors having been reduced to a minimum, and all being worked from the main deck as well as from below. The sternpost, struts, and stem are of phosphor-bronze. The stem is of the usual ram form, and the structure behind is especially strong and efficiently connected to the general framework of the vessel with a view to the contingency of ramming—the rudder, also of phosphor-bronze, is of the balanced type and controlled by Harfield's compensating gear below the protective deck. These vessels being intended for foreign service and long cruises at sea, in which the maintenance of a uniform speed becomes essential, they have been completely covered to above the load water-line with teak of a minimum thickness of 3½ inches, and coppered. To secure steadiness o gun platform, bilge keels extending for about half the vessel's length amidships have been fitted.

The protection consists of a curved deck extending from stem to stern, ranging from 3 inches to 1½ inches in thickness, covering the whole of the propelling and steering machinery, boilers, magazines, etc. The reserve bunkers are on the protective deck over the machinery space, and whilst affording a water-line belt of coal protection they, being sub-divided into water-tight compartments, give additional security in the event of damage. An armoured conning-tower of Harveyized steel is placed forward, fitted up with the usual means of navigating the vessel and directing operations while in action, the whole of the connections for which are protected by a steel tube extending to the protective deck. Three search-lights are operated from the bridges, and the vessel throughout is fitted with a complete installation of electric light. The armament consists of eleven 6-inch, eight 12-pounder Q.F. guns, and a number of smaller machine guns. The guns are all protected by extra thick shields. Two submerged torpedo-tubes are fitted forward, capable of working the latest pattern torpedoes.

The propelling machinery consists of two sets of triple-expansion engines, fitted in two separate engine-rooms, each set having four inverted cylinders and four cranks. The high-pressure cylinders are 26 inches in diameter, the intermediate-pressure cylinders 42 inches in diameter, and each of the four low-pressure cylinders 48 inches in diameter, all adapted for a stroke of 2 feet 6 inches. The cylinders are all separate and independent castings, each fitted with a cast-iron barrel or liner and steam-jacketed. Each of the high-pressure and inter mediate-pressure cylinders is fitted with piston valves, and each of the low pressure with flat slide valves all worked by the usual double eccentric and link motion valve gear. The reversing engines are of the all-round type, capable of being reversed, with worm and wheel gear ; all the levers being fitted with a slot and adjusting screw to allow of the expansion of steam in the cylinders being altered.

The following are the Mean Results of the Trials of H.M.S. "Hermes."

—	First 12 Hours' 1,000-I.H.P. Consumption Trial.		Second 12 Hours' 1,000-I.H.P. Consumption Trial.	
Date of Trial	May 31st, 1899.		June 1st, 1899.	
	Starboard	Port	Starboard	Port
Mean steam in boilers ... lbs.	239	238	166	
,, ,, at engines ,,	169	176	124	
,, cut-off in high-pressure cylinder	20 per cent.		About 50 per cent.	
Mean vacuum ... inches	26·2	26·1	26·7	27
,, revolutions	84·5	85·3	86·3	86·7
Mean pressure in cylinders: High ... lbs.	13·9	10·3	23·9	25·4
Intermediate ,,	10·5	10·1	8·6	9·4
Low, forward ,,	5·15	7·46	3·8	3·7
Low, aft ,,	4·8	60·4	3·5	3·6
I.H.P. ... High ...	89	71	166	177
Intermediate ...	186	182	156	171
Low, forward ...	119	174	90	89
Low, aft ...	112	141	84	85
Total I.H.P. ...	506	568	496	522
Gross total I.H.P. ...	1,074		1,018	
Mean coal, lbs. per I.H.P.	2·61		2·31	
Speed ... knots	10·45		10·4	

—	30 Hours' 2,000-I.H.P. Coal-Consumption Trial.		30 Hours' 7,500-I.H.P. Coal-Consumption Trial.		10,000-I.H.P. Coal-Consumption Trial.	
Date of Trial	May 30th, 1899.		June 4th, 1899.		June 6th, 1899.	
	Starb'd	Port	Starb'd	Port	Starb'd	Port
Mean steam in boilers ... lbs.	270		264		240	
,, ,, at engines ,,	155		223	222	230	228
,, cut-off in high-pressure cylinder	About 28 per cent		56	56	72	70
Mean vacuum ... inches	25·4	25·6	25·2	25·9	24·4	24·5
,, revolutions	109	108·9	165·3	166·4	181·6	183·9
Mean pressure in cylinders: High ... lbs.	34·3	35·1	88·2	91·3	100·0	95·4
Intermediate ,,	15·8	14·1	35·6	35·7	40·1	42·1
Low, forward ,,	6·2	8·5	14·9	16·3	20·6	21·3
Low, aft ,,	5·5	6·7	14·3	16·7	20·2	21·8
I.H.P. ... High ...	302	307	1,173	1,220	1,471	1,411
Intermediate ...	361	323	1,237	1,251	1,529	1,627
Low, forward ...	186	254	676	743	1,027	1,075
Low, aft ...	165	201	648	765	983	1,101
Total I.H.P. ...	1,014	1,085	3,734	3,979	5,010	5,214
Gross total I.H.P. ...	2,099		7,713		10,224	
Mean coal lbs. per I.H.P.	2·32*		1·59†		1·58	
Speed ... knots	13·4		18·8		20·5	

* Owing to this high coal consumption, the Admiralty have ordered this 30 hours' trial to be repeated.

† Allowance made for evaporation.

Steam is supplied by 18 Belleville water-tube boilers of the latest type fitted with economisers, and adapted for a working pressure of 300 lbs. The boilers are arranged in three boiler-rooms, and there are three funnels. Fans and engines are fitted in the stokeholds to insure the necessary supply of air, air-pumping engines being also fitted to deliver air direct into the furnaces and combustion chambers.

Mean Results of Additional Trials of H.M.S. "Hermes."

—	Second 30 Hours' 2,000-I.H.P. Coal-Consumption Trial.		Eight Hours' Trial of 9,000-I.H.P., with Auxiliary Machinery Exhaust Steam Passing to the Low-Pressure Receivers of Main Engines.	
Date of Trial	June 9th and 10th, 1899		June 13th, 1899.	
Mean steam in boilers ... lbs.	196		270	
,, ,, at engines ... ,,	126		247	
,, cut-off in high-pressure cylinder per cent.	Starboard 35	Port 32·7	Starboard 56	Port 56
Mean vacuum ... inches	26·0	27·0	25 1	25·2
,, revolutions per minute	111·2	110·6	174·4	176 8
Mean pressure in cylinders: High ... lbs.	40·2	35·0	105·0	96·6
Intermediate ... ,,	16·1	15·9	31·2	31·7
Low, forward ... ,,	6·86	6·21	23·0	21·8
Low, aft ... ,,	5·78	5·47	19·5	19·6
I.H.P.: High	360	312	1,470	1,374
Intermediate	377	362	1,143	1,176
Low, forward	209	189	1,099	1,058
Low aft,	176	166	934	949
Gross total I.H.P.	2,151		9,203	
Coal per I.H.P. per hour ... lbs.	1·78		1 52	
Speed per hour ... .. knots	13·4		20·0	

The "Highflyer's" trials gave even more satisfactory results, the coal consumption being unprecedentedly low on the full-power run, when the boiler pressure was maintained at 292 lbs. and at the engines the mean was 228 lbs. The links were set to cut off at 74 per cent. of the stroke, and the starboard engine running at 187·6 revolutions made 5,262-H.P. The port engine ran at 186·5 revolutions. It will be noticed from the table that the power got from the high and intermediate cylinders is almost equal, while the powers of the low-pressure cylinders also closely approximate each other. The variation is practically within the limits of error. The same remark holds good as regards the other trials, the low-pressure cylinders each giving about 66 per cent. of the power indicated in each of the high and intermediate. This arrangement gave most satisfactory results as regards engine balancing, there being practically no vibration. The collective power on this trial was 10,344-H.P. The speed of the ship was 20·1 knots, which more than meets the expectations of the designers. On the 30 hours' trial at continuous sea speed, the steam pressure was 260 lbs., and at the engines it was reduced to 223 lbs. The cut-off was arranged at 56 per cent. of the stroke, and at 169·7 revolutions the starboard engine gave 3,828-H.P., while the port engine recorded 3,816 for 168·1 revolutions. The collective power was thus 7,644 indicated, while the speed of the ship was 19·4 knots. The addition, therefore, of 2,700-I.H.P. to the power, equal to 34 per cent., barely added three-quarters of a mile to the distance run in each hour. This 19½ knots speed was got for an expenditure of 5 tons of coal per hour, which, in view of the displacement, 5,600 tons, is a very satisfactory result, proclaiming not only a high mechanical

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—	Contractors' 30 Hours' 2,000-I.H.P. Coal Consumption Trial.		Contractors' 30 Hours' 7,500-I.H.P. Coal Consumption Trial.		Contractors' 8 Hours' Full-Power Trial at 10,000-I.H.P.	
Date of Trial	June 20th and 21st, 1899		June 22nd and 23rd, 1899		June 27th, 1899	
Mean steam in boilers... ... lbs.	214		260		292	
,, ,, at engines .. ,,	125		223		228	
,, cut-off in high-pressure cylinders	34 per cent.		56 per cent.		74 per cent.	
	Star.	Port.	Star.	Port.	Star.	Port.
Mean vacuum ... ... inches	26·5	26·0	25·4	26·1	25·6	25·4
,, revolutions	110·1	110·4	169·7	168·1	187·6	186·5
H.I.P. ... High	346	320	1,313	1,265	1,610	1,523
Intermediate	341	360	1,087	1,157	1,515	1,513
Low, forward... ...	202	191	724	719	1,067	1,040
Low, aft	190	185	704	675	1,070	1,006
Gross total I.H.P.	2,135		7,644		10,344	
Coal per I.H.P. per hour ... lbs.	1·62		1·49		1·407	
Speed per hour... ... knots	12·5		19·4		20·1	

efficiency, but a beautiful form of ship and great propulsive efficiency. On the low-power trial it was preferred to work the boilers at a high-pressure, reducing it greatly at the engines and cut-off steam in the cylinders at a comparatively late period of the stroke, rather than with a high initial pressure and an early cut-off. The steam pressure was, at the boilers, 214 lbs., and at the engines 125 lbs.; this latter enabling the simple auxiliary engines to be worked at a better economy. —*Engineering.*

The first-class torpedo-gunboat "Seagull" has had a three hours' full-power trial at Portsmouth, with Niclausse water-tube boilers. The vessel drew 8 feet 7 inches forward and 10 feet 4 inches aft, and had 250 lbs. of steam in boilers with 220 lbs. at the engines. The mean vacuum was 25½ inches, and the revolutions 265 per minute. The mean I.H.P. for the three hours was 3.629, which gave an average speed of 19·15 knots. As soon as the "Seagull" can be got ready for commission she will run five trips of 1,000 miles, each at varying rates of speed, to ascertain her most economical rate of coal consumption.

The third-class cruiser "Prometheus" has been undergoing her steam trials satisfactorily. The details of her 30 hours' coal-consumption trial were as follows:—Pressure of steam in boilers, 253·4 lbs.; air pressure, 0·39 inch; vacuum, starboard 25·2 inches, port 25·8 inches; revolutions, starboard 176·5, port 177·9; I.H.P, starboard 1,739, port 1,817·9—total 3,556·9; speed, 17·5 knots; coal consumption, 2·01 lbs. per I.H.P. per hour. The draught of water forward was 12 feet 6 inches, aft 15 feet 4 inches. The results of the eight hours' natural-draught trial were also satisfactory and as follows:—Steam in the boilers, 624·9 lbs.; air pressure, 0·87 inch; vacuum, starboard 25 inches, port 25·8 inches; revolutions, starboard 198·1, port 195·6; I.H.P., starboard 2,548, port 2,635·6—total, 5,183·6; speed, 19·8 knots.

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The torpedo-boat destroyers "Chamois," "Fairy," "Gypsy," "Sylvia," and 24 torpedo-boats, Nos. 63, 64, 65, 68, 72, 73, 74, 42, 49, 66, 71, 76, 77, 79, 81, 83, 84, 45, 52, 53, 55, 57, 58, and 86, were also commissioned.

The torpedo-boat destroyer flotilla, which will consist of the 24 torpedo-boat destroyers, forming the instructional flotillas attached to the various home ports, with the four destroyers, specially commissioned, are to have a week's preliminary training in evolutions under the command of Captain Durnford of the "Vernon" torpedo-school at Portsmouth, who will hoist his commodore's pennant on the torpedo-gunboat "Jaseur." The torpedo-boat flotilla will have assembled at Plymouth and are to rendezvous at Belfast on the 22nd inst., where they will join the squadron under the command of Vice-Admiral Sir H. Rawson. As usual the port-guard and first reserve ships have been brought up to their sea-strength, the latter with the "Howe" and "Thunderer," being completed by coast-guard men.

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3. Another subsidiary object is to obtain information relative to the working of destroyers and torpedo-boats.

The two opposing fleets are to be constituted as follows :—

CHANNEL FLEET—FLEET A.

First-class battle-ships—"Majestic," "Hannibal," "Prince George," "Mars," "Jupiter," "Repulse," "Magnificent," "Resolution." Total, 8.

First-class cruisers—"Diadem," "Niobe," "Andromeda." Total, 3.

Second-class cruisers—"Mersey," "Thames," "Pique," "Terpsichore," "Arrogant," "Minerva," "Sybille," "Cambrian," "Latona," "Naïad," "Æolus," "Retribution," "Arethusa," "Furious." Total, 14.

Third-class cruisers—"Pactolus," "Pelorus." Total, 2.

TORPEDO FLOTILLA.

First-class torpedo-gunboats—"Spanker," with torpedo-boats Nos. 81, 84, 71, 76, 77, 66, 79, 42. "Gossamer," with torpedo-boats Nos. 63, 64, 65, 68, 72, 73, 74, 83. "Jason," with torpedo-boats Nos. 86, 45, 52, 53, 55, 57, 58, 49.

Making a grand total of 8 battle-ships, 19 cruisers, and torpedo flotilla 27 ; 54 vessels in all.

RESERVE FLEET—FLEET B.

First-class battle-ships — "Nile," "Trafalgar," "Sans Pareil," "Howe," "Rodney," "Benbow," "Collingwood." Total, 7.

Second-class battle-ships—"Alexandra," "Colossus," "Thunderer." Total, 3.

First-class cruisers—"Europa," "Argonaut," "St. George," "Galatea," Total, 4.

Second class cruisers—"Forth," "Severn," "Sappho," "Andromache," "Vindictive," "Diana," "Sirius," "Charybdis," "Melampus," "Apollo," "Spartan," Brilliant," "Mercury," "Gladiator," "Juno," "Rainbow." Total, 16.

TORPEDO FLOTILLA.

First-class torpedo-gunboat "Leda," with destroyers "Crane," "Chamois," "Hunter," "Flying Fish," "Lightning," "Star," "Violet," "Teazer," "Fawn," "Sylvia."

First-class torpedo-gunboat "Niger," with destroyers "Angler," "Haughty," "Cygnet," "Contest," "Janus," "Mallard," "Porcupine," "Dasher."

First-class torpedo-gunboat "Renard," with destroyers "Bat," "Ferret," "Lynx," "Seal," "Panther," "Shark," "Thrasher," "Wolf," "Fairy," "Gypsy."

Making a grand total of 10 battle-ships, 20 cruisers, and torpedo flotilla, 31 ; 61 vessels in all.

CONVOY.

"Calliope" }
"Curaçoa" } ... . Slow ships.

A first-class cruiser to be detached from B .. .. Escort.

The "General Idea" of the operations is as follows :—

1. A British convoy (C) of slow ships, escorted by a fast cruiser, on passage from Halifax to Milford Haven, is ordered to wait at a certain rendezvous the arrival of a protecting squadron.

   N.B.—The slow ships cannot be taken in tow, must remain in company, and have no fighting value.

2. A hostile squadron (A) of fast ships, lying at Belfast, is sent to sea to intercept and capture the convoy and bring it into Belfast.

3. After an interval a superior British squadron (B) of slower ships is sent to protect the convoy (C), which has been ordered to a pre-arranged rendezvous, cover it from the hostile squadron and bring it into Milford.

The whole of Ireland is hostile territory and belongs to A.

The coast of England and Wales from the Island of Islay to the Lizard, including the Scillies and the Isle of Man, is British territory.

The hostile fleet (A) has torpedo-boats at Waterford, Kingstown, and Belfast.

The British fleet (B) has destroyers at Milford Haven, Holyhead, and Lamlash.

FRANCE.—The following are the principal promotions and appointments which have been made: Rear-Admiral—L. A. Caillard to be Chief of the General Staff of the Navy. Capitaines de Vaisseau—C. V. Allys to "Melpomène"; J. F. Krantz to "Neptune"; F. A. Leygue to "Bouvet." Capitaines de Frégate—M. A. Cros to "Friant"; P. J. Darrieus to "Du Chayla"; L. J. de Mazenod to Capitaine de Vaisseau.—*Le Journal Officiel de la République Française.*

General.—Vice-Admiral Dieulouard has taken over the duties of Maritime Prefect at Cherbourg. The new first-class battle-ship "Charlemagne" commissioned at Brest on the 15th ult., with reduced complement for the trial of her guns, mountings, turrets, etc.; her heavy guns are not yet in place, but they will be hoisted on board almost immediately; it is also hoped that the "Gaulois" will be ready for her guns in August, and that both ships will, before the end of the year, have joined the Mediterranean Squadron. The torpedo-aviso "Dunois" has been commissioned at Cherbourg and is to join the Mediterranean Squadron as soon as possible. The new torpedo-aviso "Durandal" has been commissioned and joined the Squadron of the North. The new first-class battle-ship "Bouvet," which has not long joined the Mediterranean Squadron, is to be placed temporarily in the Reserve at Toulon, for an examination of her turrets, which have never worked quite satisfactorily; at the same time her above-water torpedo-tubes will be removed; it is expected she will be in the dockyard hands for at least four months. New water-tube boilers on the Niclausse system are being made for the first-class battle-ship "Marceau." The torpedo-depôt ship "Foudre" is to take the place of the old frigate "Iphigénie" as sea-going training-ship for naval cadets; she has never been a success for the purpose for which she was built, but she does not make a bad cruiser as she has a speed of 21 knots.

Retirement Regulations.—A change in the regulations is to be laid before the Chamber by the Minister of Marine, revising the law of 10th June, 1896, which fixed the age limit for retirement of officers.

The following table gives the retiring ages for the various European Navies:

Rank.	France.	England.	Italy.	Russia.	Denmark	Spain.
Vice-Admiral ..	65	65	65	65	70	72
Rear-Admiral ..	62	60	60	60	65	68
Capitaine de Vaisseau	60	55	55	55	52	62
Capitaine de Frégate	58	50	52	51	52	60
Lieutenant de Vaisseau	53	45	45	47	42	55

and it will be noticed that with the exception of Spain no other nation has so high an age limit as France. This defect has long been recognised, and in 1898 Admiral Besnard as a temporary measure retired 29 capitaines de frégate and lieutenants to accelerate promotion; but by one means or another these officers have since been restored to their positions on the active list, and the block is consequently now worse than ever.

The age limits proposed by the new project of law are those of the English Navy; the retirements, however, will not all come into force at once, but will be spread over a period of years as follows:—

The age of 65 now fixed for the retirement of vice-admirals comes into force at once.

The age of 60 for rear-admirals will not come into full force till 1903, being lowered six months per year.

The age for capitaines de vaisseau and capitaines de frégate, and lieutenants will be lowered at the rate of twelve months per year till the new age is reached, which will be 1904 for capitaines de vaisseau and 1907 for capitaines de frégate and lieutenants.

New Rank.—The rank of capitaine de corvette is to be revived in the French Navy under a new name, and the 150 senior lieutenants are to receive the title of "lieutenants de vaisseau majors." These officers will rank for promotion as before, and will be specially appointed as senior lieutenants of large ships and as second in command of cruisers commanded by capitaines de frégate. Their uniform will be distinguished by a gold anchor placed above the lace on the sleeve.

The New Minister of Marine.—M. de Lanessan, the new Minister of Marine, was born at Saint-André-de-Cubzac (Gironde), on 13th July, 1843. He served as an Army surgeon during the war of 1870-71, and was in 1876 appointed professor of natural history at the Faculté de Médecine, Paris. He was elected a municipal councillor for Paris in 1878, and député for the fifth arrondissement of Paris in 1881, and for the Seine in 1885. In 1891 he was appointed Governor-General of Indo-China, where for 3½ years he laboured hard at the development of the colony. Returning to France, M. de Lannesan commenced work as a journalist, and in 1898 was elected député for Lyons.

For some time he has taken an active part in all the discussions of the Navy in the Chamber, and in 1890 he published a book, "La Marine Française au Printemps de 1890," a very complete work, which probably indicates the policy that will be adopted by him as Minister of Marine.

Steam Trials.—The new first-class cruiser (commerce-destroyer) "Guichen" has made another trial at Toulon; with the engines developing 18,500-I.H.P., and making 112 revolutions, the mean speed was 20 knots; it does not seem likely at present that the anticipated speed of 23 knots will be reached.

The third-class cruiser "Lavoisier," belonging to the Mediterranean Squadron, has been carrying out some full-speed trials on the measured mile off the Hyères Islands, when she attained a speed of 21·4 knots.

The first-class cruiser "Tage" has been carrying out her annual trials from the Reserve at Brest. For two hours, with the engines making 85 revolutions, the speed maintained was 18 knots.

The trials of the new torpedo-aviso "Dunois" have not been so successful as was at first anticipated, as the highest speed she has realised has been only 21·7 knots instead of the 23 provided for in the contract. At her last trial, with the engines developing 7,719-I.H.P., the coal consumption was 842 grammes per H.P. per hour.

New Ships.—One of the last acts of M. Lockroy, before vacating the Ministry of Marine, was to order the laying down at Cherbourg of two more submarine boats of the "Narval" type. They are to be commenced immediately, and are to be called the "Sirène" and "Triton."

Orders have been given to lay down at Rochefort four torpedo-boat destroyers of the "Fauconneau" type, the plans for which have been drawn out by M. Normand of Havre; they are to be called the "Pertuisane," "Escopette," "Rapière," and "Flamberge." They differ slightly in their dimensions from the "Durandal" class, being 3 feet 3 inches longer, and 3 tons more displacement. The armament will be the same, viz., one 6-pounder and six 3-pounder Q.F. guns, with two torpedo-tubes. The speed is to be 26 knots, with a coal supply of 38 tons, giving them a radius of action at 10 knots of 2,390 miles, and of 220 miles at 26 knots.

The new first-class armoured cruiser "Marseillaise" (formerly C. q.) will be commenced shortly at Brest. Her dimensions will be as follows:—Length, 138 metres (453 feet); beam, 20·20 metres (66 feet); displacement, 10,014 tons; speed,

21 knots. She will have three propellers and water-tube boilers. Her normal coal capacity will be 970 tons, but it will be possible to stow 1,590 tons. With normal coal supply, her radius of action at 10 knots will be 6,500 miles, and at full speed 1,230 miles. With the extra 620 tons of coal these distances will be increased to 10,400 miles and 1,940 miles respectively.

The armoured protection will consist of a belt 150 millimetres (6 inches) thick, the battery being plated with 130-millimetre (5¼-inch), and the turrets with 200-millimetre (7¾-inch) plates, and there will be a protective deck plated with 50-millimetre (2-inch) plates. Her armament will comprise two 19·4-centimetre (7·6-inch); eight 16·4-centimetre (6·4-inch) Q.F. guns; six 10·0-centimetre (3·9-inch); eighteen 47-millimetre (1·75-inch), and six 37-millimetre (1·5-inch) guns. She will have four torpedo-tubes, two of which will be submerged. She will cost 21,000,000 francs (£840,000), and the plans are by M. Bertin, director of the *Section Technique* of the Navy.

Launches.—The first-class cruiser "Jurien de la Gravière" was launched at Lorient on 26th June in the presence of 10,000 spectators. Her dimensions are:—Length, 137 metres (449 feet); beam, 15 metres (50 feet); H.P., 17,400. She has three propellers, and a normal coal capacity of 600 tons, which can be increased to 900, giving a radius of action respectively of 6,150 miles, and 9,300 miles at 10 knots, and of 880 miles and 1,330 miles at full speed. Her armament will comprise eight 16·4-centimetre (6·4-inch), two 65-millimetre (2·5-inch), ten 47-millimetre (1·75-inch), and ten 37-millimetre (1·5-inch) Q.F. guns, and she will have two submerged torpedo-tubes. Her complement is to be 29 officers and 482 men, her cost 11,337,439 francs (£453,497 11s. 8d.), and she is to be completed by the end of next year.

The new first-class gun-boat "Décidée" was also launched at Lorient the same day. She is a vessel of 645 tons displacement, 184 feet 8 inches long, with a beam of 26 feet 3 inches. Her engines will develop 1,000-I.H.P., giving a speed of 13 knots. Her armament will consist of two 10-centimetre (3·9-inch) Q.F. guns with four 6-pounder and four 3-pounder Q.F. guns. She will have three masts and be square-rigged forward, and has been launched in a very advanced state towards completion.

The following interesting description of the new first-class armoured cruiser "Jeanne d'Arc" has been reproduced from the *Engineer*, for the benefit of readers of the JOURNAL who may have no opportunity of seeing the paper in question:—

"The commerce-destroyer "Jeanne d'Arc," launched on Thursday, June 8th, is in some ways the most important vessel ever constructed for the French Navy. This importance is not confined to the ship herself; it represents a new *motif*, and a *motif* specially considered in connection with this country. At the time that she was laid down the references in some French newspapers to Joan of Arc, and the ignominious defeats that the Maid of Orleans inflicted upon the English, were not called forth merely by the name. "Jeanne d'Arc" is no new name in the French Navy List. What a good many sanguine Frenchmen look for, or did look for, was that the "Jeanne d'Arc" would form a type of vessel before which *perfide* "Albion" would have to go down. In other words, the "Jeanne d'Arc" is the pioneer of a type intended not merely to be able to destroy our commerce—which a "Guichen" or "Château-Renault" could do equally well—but to be able to chase from the seas our "Powerfuls" and "Diadems." Too swift to be caught by battle-ships, the dream embodied in the "Jeanne d'Arc" seemed sufficiently real and possible to our Admiralty to lead to the laying down of a good many "Cressys" and "mighty cruisers." Certainly, on paper, the "Jeanne d'Arc" looks infinitely better all round than our "Powerfuls" and "Diadems."

The following are the "fighting qualities" of the three types. Many of our readers must by now be familiar with the "War Game" notations of guns and

armour, which we have before now utilised for rapid comparisons. We introduce them here: –

——	"Terrible."	"Jeanne d'Arc."	"Diadem"
Tonnage	14,200	11,270	11,000
Complement	894	626	677
Guns 1°	two 9·2-inch (B)	two 194 mm. / 7·6-inch (C)	nil
Q.F. 2°	twelve 6-inch (D) / sixteen 3-inch (12-pounders)	fourteen 5·5-in. (D)	sixteen 6-in (D) / twelve 3-in. (F) / (12-pounders)
Q.F. 3°	twelve 3-pounders	sixteen 3-pndrs. / eight 1-pndr.	twelve 3-pndrs
Armour:			
On 1° guns	6-inch (C)	6-inch (C)	—
On 2° guns	6-inch (*c*)	6-inch (C)	4½-inch (*c d*)
Water-line	nil	6-inch (*c*)	nil
Lower deck	nil	3-inch (Σ)	nil
Slopes of armour deck in inches, 6 inches equivalent to a protection of	= *a a*	3-inch (*c*)	= *b*
Protection to vitals	= *a a*	= *a a*	= *b*
H.P. (maximum) ...	25,000	28,500 (estimated)	18,000
Speed (maximum), knots	22	23 (estimated)	20·8
Screws	2	3	2
Coal (normal), tons	1,500	1,400+petroleum	1,000
Bunker capacity, tons	3,000	2,000+petroleum	2,000

Now from this it is evident that the armoured water-line and extra speed are the "Jeanne d'Arc's" *pros*, while the lack of 3-inch guns makes her armament comparatively inferior. Before, however, proceeding to carry the comparison further, we will give further details of the French cruiser.

The water-line belt is complete. Probably it will, like French belts generally, be completely under water; indeed, by design it is practically that. Above it, however, the lower deck is protected by 3-inch armour of a resisting value equivalent to the coal-bunkers on the "Powerful's" lower deck. Probably there are bunkers behind that might be full; but as the ship will carry only 1,400 tons normally, while the "Powerful" normally stows nearer 3,000 than her nominal 2,000, the "Powerful" has a superior coal protection. Now the 3-inch armour of the "Jeanne d'Arc" is not thick enough to keep out our 6-inch Lyddite shell, consequently, save for hits at a wide angle, is of little more utility than the unarmoured side of the "Powerful," and trusting, as this ship does, to her coal-bunkers, it is not impossible that her water-line will prove in practice quite as safe as the "Jeanne d'Arc's."

The protective deck of the "Powerful" being thicker, it will be noted that her vitals are as safe as those of the "Jeanne d'Arc." So, so far as the "Jeanne d'Arc" is concerned, are those of the "Diadem"; the 8-inch guns could never penetrate the "Diadem's" deck, except possibly at the muzzle. The weak point in the "Diadem" and the "Powerful," the ability of 3-inch guns to destroy their water-lines, the "Jeanne d'Arc" is not provided to cope with. The entire bow of the "Jeanne d'Arc" is covered with 3-inch armour, some protection to the base of the forward 7·6-inch guns, but again too thin to keep out shell, except at very long range and at an acute angle. She would have to fight at long range to avail herself of it, and then the absolutely unprotected bases of her 6-inch guns would give trouble. The "Powerful" has casemates or bunkers under her 6-inch guns, and being a heavier ship with less armour to carry, she is presumably of stouter construction to withstand shell under the guns.

As originally designed it was intended to give the "Jeanne d'Arc" eight instead of fourteen 5·5-inch guns (13·8-centimetre) and twelve 3·9-inch guns. These twelve would have been carried where the six upper-deck 5·5-inch pieces now are, that is to say, eight in caves about the forward group of funnels, and four aft in gun-houses of a kind. It was concluded that these 3·9-inch pieces would be of little use, so every other one was knocked out and 5·5-inch guns substituted. This had the additional advantage of simplifying the armament, an important thing, seeing that how to supply the guns has been a tremendous problem, even with the simpler armament.

The fact is that the 23 knots of the "Jeanne d'Arc" have to be paid for, and paid for heavily. The whole of the ship between the masts is occupied with engines and boilers. The French take some pride in themselves over the ingenious way in which, despite the huge space taken by the engines, they have been able to work in magazines below them, and run the ammunition hoists up through boiler-room and machinery. It is a triumph—of a sort; but though ammunition hoists passing close to furnaces, and kept at a temperature of 40° or 50° by means of refrigerators inside them may be exceedingly ingenious, and may work all right, their existence is not likely to assist the engine-room department in maintaining that coolness of temperament which will be necessary to ensure the 23 knots.

Taking her all in all, the "Jeanne d'Arc" is an ingenious vessel—too ingenious. Despite all that has been written by partially-informed critics, we feel certain that in war-time she would be no match for the "Powerful"; and in action with the splendidly simple "Diadem" would by no means be a certain winner. Personally we should feel happier in the "Diadem." In energy of fire, on paper, the "Jeanne d'Arc" has, we know, a better broadside, while her end-on fire, again mightily ingenious, is ten 5·5-inch and one 7·6-inch, against six 6-inch, on paper. On the beam or quarter there are positions in which she could bring four, or even six, 5·5-inch guns and one 7·6-inch against the "Diadem's" three, or say four 6-inch. But the difficulties of securing such a position, and the still greater one of maintaining it, practically put it out of court. Her armoured area throws that of the "Diadem" into complete insignificance. But, as we have shown, the value of her armour is very slight, and it stands to reason that on the same displacement of the "Diadem" a cruiser cannot have all this armour and extra H.P. without heavy sacrifices elsewhere. Battles are fought at sea, not on paper.

We would not go quite so far as to characterise the "Jeanne d'Arc" as a "fraud," but she is not far from it, and certainly will never sweep our cruisers from the sea. We have purposely compared her to the "Powerful" and "Diadem" rather than the new cruisers, because those are the ships she was designed to compete with. As to our new cruisers, the "Cressys" and "Drakes," there is no comparison possible. These are practically "Powerfuls" with sides armoured better than those of the "Jeanne d'Arc," and—important point—with the bases of the gun positions unassailable by shell. As to speed, the "Jeanne d'Arc's" 23 knots mean nothing as yet. No "maximum speed" could be kept up at sea, if even it could be reached. The question is, What is the highest constant speed she will be capable of, and for how many hours? Modern French battle-ships are swifter than those we have in commission, but their coal will not allow of more than a comparatively few hours' steaming at it; hence much of its value is lost. Carrying liquid fuel in addition to her 1,400 tons of coal, the "Jeanne d'Arc" may be better off than many ships in this respect, but this question cannot be profitably discussed till she has been on trials, and we are not sufficiently acquainted with her lines to know whether, like British cruisers, she can fill her bunkers to the maximum capacity and yet lose next to no speed in consequence.

To return to the discussion of the "Jeanne d'Arc's" details. She is 477 feet long, 63⅔ feet broad, and will draw 26½ feet of water. The engines will be three sets of vertical triple-expansion, each set actuating a screw. Steam will be

supplied by forty-eight Du Temple boilers, as at present decided, but possibly some other boiler may be substituted; there is very strong agitation in France in favour of the Niclausse.

The form of funnels, or rather, forms adopted for the "Jeanne d'Arc," is worthy of remark. The casing of the after group is to be kept low "in order to assist stability." Here, again, is an exhibition of ingenuity that, had the ship been one of ours, we should not regard the need of—if it is a case of necessity, or anything approaching necessity—with particularly pleasant feelings. There seems too much "wonderful balancing feat" about it.

The "Jeanne d'Arc," in fine, is likely to prove a "Great Eastern"—more wonderful than useful."

It is a French custom to give various decorations after the launch of a ship of war. After the launch of the "Jeanne d'Arc" one officer decoration and three chevalier decorations of the Legion of Honour, and five *médailles militaires* were conferred on those concerned.—*Le Temps*, *Le Yacht*, and *Engineer*.

ITALY.—The following are the principal appointments which have been made: Rear-Admiral G. Bettolo to be Minister of Marine. Vice-Admirals—E. Accinni to be President of the Superior Council of the Navy; G. Frigerio to command of Reserve Squadron; G. Grandville to command of 3rd Maritime Department (Venice); C. Morin to command of 1st Maritime Department (Spezia); Rear-Admirals—A. Grenet to command of China Squadron; C. A. Candiani to command of Naval Station of Maddalena; C. Farina to be second in command of Active Squadron; G. B. Mirabello to be Vice-Admiral.—*Gazzetta Ufficiale*.

The following is the proposed constitution of the different squadrons for the financial year from 1st July, 1899, to 30th June, 1900, as laid down in the Naval Estimates presented to Parliament:—

Active Squadron under command of Vice-Admiral Magnaghi, to be eight months in full commission and four months with reduced complements.

First-class battle-ships—"Sicilia" (flag-ship of Commander-in-Chief), "Morosini" (flag-ship of Rear-Admiral Farina), "Sardegna," "Dandolo," "Andrea Lauria," "Doria."

First-class armoured cruiser—"Vettor Pisani."

Second-class cruiser—"Lombardia."

Torpedo-cruisers—"Calatafimi" and "Goito."

Cistern-ship—"Tevere."

Reserve Squadron under command of Vice-Admiral Frigerio, to be two months fully commissioned, six months with reduced complements, and four months in the Reserve.

First-class battle-ships—"Lepanto" (flag-ship of Commander-in-Chief), "Re Umberto."

Third-class battle-ships—"Affondatore," "Ancona," "Castelfidardo," "Maria Pia," and "San Martino."

Second-class cruisers—"Vesuvio" and "Etruria."

Torpedo-cruisers—"Partenope," "Urania," and "Montebello."

Atlantic Naval Division, under command of Rear-Admiral A. Di Brocchetti.

First-class armoured cruiser—"Carlo Alberto."

Second-class cruisers—"Etna," "Giovanni Bausan," and "Dogali."

Torpedo-cruiser—"Caprera."

China Squadron, under command of Rear-Admiral A. Grenet.

First-class armoured cruiser—"Marco Polo" (flag-ship of Commander-in-Chief).

Second-class cruisers—"Stromboli," "Elba," and "Piemonte."

Red Sea and East Indian Squadron:—

First-class gun-boats—"Curtatone," "Governolo," and "Provana."

Despatch-vessel—"Staffetta."

The following ships will be in commission for training purposes :—

Attached to the Naval Academy, the corvettes "Flavio Gioia," "Amerigo Vespucci," and the gun-boat "Volturno," to be four months in commission and eight months "en disponibilité."

Training-ships for Boys.—Corvette "Caracciolo," with three sailing tenders, the "Miseno," "Palinuro," and "Chioggia," to be six months in full commission and six months in reserve.

For use of Gunnery School.—The "Duilio," "Terribile," and "Tino"; and for the Torpedo School, the "Trinacria."

The following torpedo-boats are also in commission with reduced crews :—

At Genoa.—Nos. 100, 101, 102, 104, 105, and the "Condore."
At Spezia.—Nos. 25, 29, 31, 32, 36, 38, 42, 57, 98, 107, 108, 110, 111.
At Leghorn.—Nos. 112, 113, 114, 115, 116, 117, 11.
At Maddalena.—Nos. 72, 73, 74, 80, 81, 82, 83, 84, 85, 86, 87.
At Gaeta.—Nos. 118, 119, 120, 121, 122.
At Taranto.—Nos. 153, 152, 151, 148, 147, 145, 142, 137, 149, 150, 26, 27, 33, 39, 40, 41, 42, 43, 47, 49, 51, 54, 55, 56.
At Messina.—Nos. 140, 131, 133, 136, 130, 138, 139, 141.
At Civita Vecchia.—"Aquila," "Falco," "Avoltoio," "Nibbio," "Sparviero," and Nos. 60, 61, 62, 63, 64, 65, 68, 69, 70, 71, 88, 91, 92, 93, 94, 95, 96, 97.
At Venice.—No. 23, 30, 78, 79.
At Miseno.—Nos. 124, 125, 126, 127, 128, 129.

Torpedo-boats "en disponibilité" :—

At Spezia.—Nos. 62, 66, 22, 24, 44, 45, 46, 52, 53, 89, 99, 103, 90, 106.
At Naples.—Nos. 109, 125.
At Taranto.—Nos. 48, 55, 146.
At Venice.—Nos. 34, 35, 37, 59, 77.

The Admiralty Council.—The new council which has now commenced its duties is under the presidency of Admiral H.R.H. the Duke of Genoa, and consists of the following members:—Vice-Admirals Morin, Gonsalez, and Grandville, the commandants of the 1st, 2nd, and 3rd Maritime Departments respectively; Rear-Admiral Candiani, Commandant of Maddalena; Vice-Admiral Gualterio, Commandant of Tarentum; Vice-Admirals Magnaghi and Frigerio the commanders-in-chief of the Active and Reserve Squadrons respectively; and Rear-Admiral Mirabello, Chief of the General Staff of the Navy.

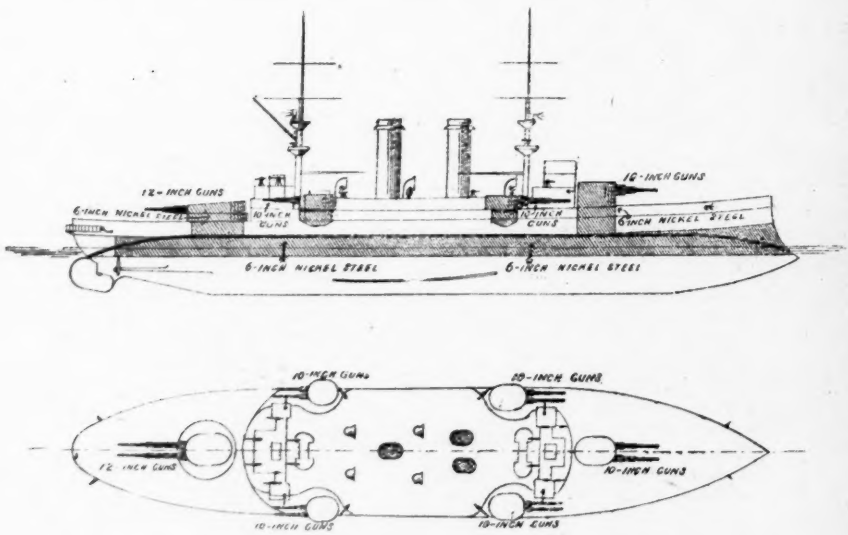
The Officers' Corps.—The strength of the officers of the military branch of the Navy has been fixed by royal decree, as follows :—1 admiral, 7 vice-admirals, 13 rear-admirals, 59 captains of battle-ships, 66 frigate-captains, 70 commanders, 365 lieutenants, 167 sub-lieutenants, and 120 midshipmen.

Strength of Local "Défenses-Mobiles."—The *personnel* for the current year has been fixed as follows :—

	In Peace-time.		In War.	
	Officers.	Men.	Officers.	Men.
Spezia	34	1,427	52	1,427
Maddalena	24	851	66	1,096
Tarentum	15	396	30	541
Venice	15	317	26	675
Genoa	2	42	5	115
Messina	4	67	8	120
Gaeta	4	81	8	149
Ancona	1	11	2	32

New Ships.—The following ships are at present under construction :—The first-class battle-ships "Regina Margherita," at Spezia, and the "Ammiraglio

Benedetto Brin," at Castellamare, near Naples. We gave a short description of these ships last year in the September number of the JOURNAL, but there seem to have been some alterations made in their design, and the following are the correct details as far as we can gather. Their dimensions are as follows:—Length over all, 433 feet; between perpendiculars 413 feet; beam, 78 feet; displacement, 14,000 tons, with a draught of 27 feet. Protection is afforded by a 6-inch belt of nickel steel, extending from the ram to within 50 feet of the stern, and which reaches from some 3 feet below the water-line up to the level of the main deck; the bulkheads are 10 and 12 inches in thickness, the armour on all the gun positions is 6 inches thick, and the armoured deck is 3·2 inches, tapering to 1·5 inches. The armament of these ships is somewhat peculiar, and consists of two 12-inch guns, in a hooded barbette aft, and ten 8-inch Q.F. guns in pairs in turrets, one turret being forward and the other two on each beam, the after pair being sponsoned out; there are also sixteen 12-pounder and eight 3-pounder Q.F. guns, with four torpedo-tubes, three of which are submerged. The engines are to develop 14,000-I.H.P., under natural, and 18,000-I.H.P. under forced draught, giving speeds of 18 and 21 knots respectively. The "Regina Margherita" is to be fitted with Niclausse boilers, which will be supplied by the Ansaldo firm, while the "Benedetto Brin" is to have Belleville boilers, manufactured by Hawthorne, Leslie and Co., of Newcastle-on-Tyne. The coal supply is to be 1,000 tons normal, and 2,000 when complete to full capacity, giving a radius of action of 5,000 to 10,000 knots at 10 knots speed respectively. A third ship of the same type, the "Principessa Elena," will, it is hoped, be laid down this year, while the construction of a fourth, the "Ammiraglio Racchia," which was projected last year, still hangs fire.



PROFILE AND DECK PLANS OF "REGINA MARGHERITA."

At Venice a new first-class armoured cruiser, to be called the "Francesco Ferraccio," has been laid down, while two other vessels of a similar type, the "Giuseppe Garibaldi" and "Varese," are under construction at the Ansaldo Works, Sestri Ponente, and the Orlando Works, Leghorn. The new "Giuseppe

Garibaldi" is the fourth of her name, the first and third having been sold to the Argentine Government, and re-named the "Garibaldi" and the "General Pueyrredon" respectively while the second was sold to the Spanish Government, re-named the "Cristobal Colon," and sunk in the action with the U.S. squadron off Santiago last year. The new "Varese" is the third of her name, her two predecessors were both sold to the Argentine Government, and have been re-named the "San Martin" and the "General Belgrano."

Progress is also being made with the first-class battle-ship "Emanuele Filiberto" building at Castellamare, a sister ship to the "Ammiraglio di Saint Bon." These vessels are smaller than the "Regina Margherita" type. Their dimensions are as follows:—Length, 344 feet 6 inches; beam, 69 feet 4 inches; displacement 9,800 tons, with a mean draught of 24 feet 9 inches. The engines are to develop 9,000-I.H.P. under natural, and 13,500 under forced draught, giving a speed of 16 and 18 knots respectively. The coal stowage will be 600 tons normal and 1,000 tons at full capacity, giving a radius of action of 4,000 and 7,500 miles at 10 knots; petroleum fuel will also be carried in the double bottoms. Armour protection is afforded by a nickel steel water-line belt 9·8 inches thick, tapering to 3·9 inches. Above this belt is a redoubt protected by 6-inch armour about 250 feet in length, and above this again is a central battery amidships similarly protected. The two barbettes for the heavy guns have 9·8 inch armour, the conning-tower 6 inches, and the armoured deck is 3 inches thick tapering to 1·5 inches. The armament consists of four 10-inch guns mounted in pairs in the barbettes, one forward and one aft; eight 6-inch Q.F. guns in the central battery, eight 4·7-inch Q.F. guns on the superstructure, with ten 6-pounder and twelve 1-pounder Q.F. guns; and four torpedo-tubes, all submerged.

The six torpedo-boat destroyers laid down at the end of last year are to be called the "Dardo," "Strale," "Nembo," "Turbine," "Aquilone" and "Borea." They will have a displacement of 250 tons and a speed of 30 knots. The new torpedo-boat "Condore" attained a speed of 19 knots under natural and 21·2 knots under forced draught.

The first-class armoured cruiser "Vettor Pisani" has been undergoing her trials successfully; at her eight hours' natural-draught trial the engines developed 8,290-I.H.P., giving a speed of 17·5 knots, at a coal expenditure of 889 grammes per H.P. per hour.

The Naval Estimates, 1899-1900.—The Estimates, Ordinary and Extraordinary, amount to 109,147,326 lire (about £4,365,893, reckoning 25 lire = £1), as against 105,325,124 lire (about £4,213,004) for 1898–99, showing an increase of 3,822,202 lire (about £152,888) over last year. The principal items are as follows:—For ships in commission, in the Reserve and fitting out, 5,700,000 lire (£228,000); for the General Staff of the Navy, 3,233,700 lire (£129,348); for the Corps of Naval Engineers (engineer officers, assistants, and artificers), 1,345,000 lire (£53,888); Naval Commissariat officers, 917,800 lire (£36,712); medical staff, 671,410 lire (£26,856); pay for men, 12,40,000 lire (£496,000); gratuities, 1,221,700 lire (£48,868); semaphore service, including pigeons, 180,000 lire (£7,200); semaphore service material, 230,000 lire (£9,200), which provides for the building of five new semaphore and pigeon-stations; coal and other combustibles, 3,500,000 lire (£140,000); hydrographic service, *personnel* and material, 329.312 lire (£13,172); material for maintenance of existing ships, 7,380,000 lire (£294,400); labour for repair of ships, 5,790,000 lire (£231,600); guns, etc., 8,400,000 lire (£336,000); labour for construction of guns, etc., 2,223,025 lire (£88,921); materials and labour for buildings, fortifications, and hydraulic works, 2,453,613 lire (£98,144); construction and completion of the following ships:—

First-class battle-ships—"Benedetto Brin," at Castellamare; "Regina Margherita," at Spezia; "Emanuele Filiberto," at Naples.

Armoured cruisers—"Francesco Ferrucio," at Venice; "Giuseppe Garibaldi," at Sestri Ponente; "Varese," at Leghorn; and a new vessel, to be called the "Basilicata," at Taranto.

Second-class cruiser—"Puglia," at Taranto.

Torpedo-cruisers—"Agordat," at Castellamare"; and "Coatit," at Naples.

And certain torpedo-boat destroyers, torpedo-boats, and other small craft, 23,000,000 lire (£920,000).

Coast defences, including the fortification and armament of Maddalena, 300,000 lire (£12,000); purchase of torpedoes, 500,000 lire (£20,000); premiums and subsidies to the mercantile marine, 1,112,000 lire (£44,480).

During the last twelve months the following ships were added to the strength of the fleet:—The first-class battle-ship "Saint Bon," the first-class armoured cruiser "Vettor Pisani," the torpedo-boat destroyer "Fulmine," and the torpilleurs-de-haute-mer "Condore" and "Pellicano." During the coming year the torpedo-cruisers "Agordat" and "Coatit" are to be completed, with four of the new torpedo-boat destroyers and five torpilleurs-de-haute-mer.—*Stato di Previsione della Spesa del Ministero della Marina* and *Mittheilungen aus dem Gebiete des Seewesens.*

UNITED STATES.—*Water-Tube Boilers.*—It has been definitely decided that all vessels of the Navy hereafter shall be equipped with boilers of the tubular type. It has been recommended by Rear-Admiral Melville that the battle-ships "Maine," "Missouri," and "Ohio" shall be constructed under plans that require these boilers, and the armoured cruisers and unprotected cruisers authorised last session shall also be similarly equipped. It is the opinion of Admiral Melville, that experience justifies the Department in applying generally this type of boiler to the new vessels authorised. They were first used in the monitor "Monterey" and have been successful in all respects. The torpedo-boats "Cushing" and "Ericsson" were supplied with them also, and the "Atlanta," "Chicago," "Annapolis," "Marietta," and "Nashville" have them installed. The decision to utilise tubular boilers in the future is the result of ten years' observation of their performance in foreign Navies and in the merchant service. A great saving of weight is made by their use, and economy is secured by the ease with which they can be removed and new sections substituted for those which may be injured or wear out. In the old type of boiler it was necessary to rip up the decks in order to remove the defective parts. Admiral Melville states that while the tubular boiler takes up more room than the old type it weighs considerably less.

Launch.—The U.S. torpedo-boat destroyer "Stringham," the pioneer of the ocean-going vessels of her class, and the largest and costliest of her type, was successfully launched from the yards of Harlan and Hollingsworth, Wilmington, Delaware, on June 10th.

The keel of the "Stringham" was laid March 21st, 1898, and the contract date of completion was July 20th, 1899, and the price for hull and machinery, exclusive of ordnance and outfit, is $236,000. She is 225 feet long, 22 feet extreme beam, and at 6 feet 6 inches mean draught displaces 340 tons. The design in its general features follows the English type of boat, but it is not a close copy of foreign plans. She has four Thornycroft water-tube boilers, exhausting into three funnels, and the two middle boilers having a common funnel. The engines are twin screw, vertical inverted, triple-expansion, designed to indicate 7,200-H.P., which is expected to drive the boat at least at the guaranteed speed of 30 knots per hour. Her allowance of coal at the normal draught of water is 35 tons and her bunkers will stow 120 tons. She carries an unusually heavy battery for boats of her class, as in addition to two deck discharging tubes for 18-inch Whitehead torpedoes, she mounts seven 6-pounder rapid-fire guns, one on top of each of the conning-towers, and the other five on the deck between the conning-towers.

The officers' quarters aft consist of a cabin and a state-room for the captain, a state-room each for the executive officer and engineer, and a mess-room, abaft which is a pantry and a bath-room. Forward of the captain's quarters is a compartment with four berths for petty officers and one with six berths for

machinists. Forward of these is the firemen's quarters with twelve berths. Forward of the firemen's quarters is the engine-room, occupying the full width of the boat for 28 feet, and then come the boiler compartments and coal bunkers, which absorb 73 feet of the length of the boat. Forward of the boilers is the galley, and then the crew's quarters, with twenty folding berths, and in the extreme bow the windlass compartment. A turtle back is built from the forward conning-tower to the stem and the latter has a sharp rake instead of being plumb as usual.

The speed trial will be made as soon as possible after launching, and after completion and acceptance she will be sent to League Island Navy Yard for commissioning.

Coaling Stations.—Two of the most important coaling stations for the Navy on the Atlantic seaboard will soon be provided with facilities for promptly supplying war-ships with fuel under all weather conditions at any tidal stages. At Dry Tortugas, which for years have not been occupied by the Government authorities, there will be within a few weeks a coal depôt unsurpassed in this country. A deep channel from the outer road-bed to the inner harbour has been dug, safe anchorage grounds marked, and immense sheds, with a capacity of 40,000 tons built. Piers have been provided at which battle-ships and large cruisers may receive coal direct from the sheds to their bunkers. Half a million dollars have been expended in establishing this station, and equally as much will be expended in filling the sheds with coal. Dry Tortugas is to become part of the naval station at Key West, and under the charge of its commandant. On the north there is to be another important station at New London, where $150,000 are being devoted to establishing a coaling depôt, the Navy Department having abandoned the port as a regular navy yard. Work there has so far progressed that the authorities are confident that the new station will be fully prepared for operations in the late autumn. New London will be the coaling depôt for ships ordered to the New York navy yard.

State of Advancement of New Ships.—The degree of completion of vessels under construction for the United States Navy, as shown by the official records of May 1st, 1899, is as follows:—Battle-ships—"Kearsarge," 90 per cent.; "Kentucky," 88 per cent.; "Illinois," 65 per cent.; "Alabama," 82 per cent.; "Wisconsin," 67 per cent.; "Maine," 4 per cent.; "Missouri," 1 per cent.; "Ohio," not started. Sheathed cruisers—"Albany," 80 per cent. Monitors—"Arkansas," not started; "Connecticut," 4 per cent.; "Florida," 6 per cent.; "Wyoming," 1 per cent. Torpedo-boat destroyers—"Bainbridge," 7 per cent.; "Barry," 7 per cent.; "Chauncey," 7 per cent.; "Dale," 3 per cent.; "Decatur," 3 per cent.; "Hopkins," 17 per cent.; "Hull," 17 per cent.; "Lawrence," 15 per cent.; "Macdonough," 14 per cent.; "Paul Jones," 5 per cent.; "Perry," 5 per cent.; "Preble," 5 per cent.; "Stewart," 2 per cent.; "Truxton," 3 per cent.; "Whipple," 3 per cent.; "Worden," 3 per cent. Torpedo-boats—"Dahlgren," 96 per cent.; "T. A. M. Craven," 92 per cent.; "Stringham," 75 per cent.; "Goldsborough," 65 per cent.; "Bailey," 55 per cent.; "Bagley," not started; "Barney," not started; "Biddle," not started; "Blakely," 25 per cent.; "DeLong," 25 per cent.; "Nicholson," 31 per cent.; "O'Brien," 32 per cent.; "Shubrick," 22 per cent.; "Stockton," 22 per cent.; "Thornton," 21 per cent.; "Tingey," 20 per cent.; "Wilkes," 6 per cent. Training-vessel or Naval Academy—"Chesapeake," 78 per cent. Submarine torpedo-boat—"Plunger," 85 per cent.—*Army and Navy Record.*

Armour Plate Trials.—At the Redington proving grounds of the Bethlehem Iron Company a very interesting series of tests were made recently on a 6¼-inch armour plate, face-hardened by the Krupp process. The result is a particularly interesting one, in view of the fact that an 8-inch gun was used. The following is the official report:—

Plate mounted on backing of 12 inches of oak and 1⅜ inches of soft steel skin plate, attacked by 8-inch gun. Size of plate, 9 feet by 6 feet 2 inches by 6¼ inches.

First Round.—An 8-inch French Holtzer armour-piercing projectile; weight 250½ lbs.; struck the plate with a velocity of 1,520 foot-seconds, developing an energy of 4,107 foot-tons; penetration ¾ inch; point of impact, 30 inches from top edge and 30½ inches from right-hand end of plate. Projectile was completely broken and thrown to rear; plate and backing uninjured.

Second Round.—Projectile, 8-inch Midvale Holtzer, 1898 manufacture; weight, 252½ lbs.; striking velocity, 1,623½ foot-seconds; energy, 4,619 foot-tons; point of impact, 23 inches from right end, 26 inches from bottom edge of plate, and 18½ inches from impact No. 1; penetration, 2½ inches. Point of shot fused to plate and remainder broken and thrown to rear; no radial or other crack; slight spalling off of face of plate around shot hole; one backing bolt broken and wood of backing splintered at right end of plate.

Third Round.—Projectile, 8-inch Midvale Holtzer, 1898 manufacture; weight, 252 lbs.; striking velocity, 1,730 foot-seconds; energy, 5,234 foot-tons; point of impact, 27 inches from bottom of plate, 27 inches from impact No. 1, and 29 inches from impact No. 2; penetration, 6¼ inches. No cracks whatever; slight spalling off of face of plate around shot hole; head of projectile fused to plate, and remainder broken and thrown to rear.

Fourth Round.—Projectile Midvale Holtzer, 1898 manufacture; weight, 252⅛ lbs.; striking velocity, 1,828 foot-seconds; energy, 5,847 foot-tons; point of impact, 28 inches from top edge, 34 inches from left end, and 26 inches from impact No. 3. Projectile passed through plate and backing, the broken pieces lodging in sand butt; no crack in plate; slight spalling off of face of plate around shot hole.

Fifth Round.—Projectile Midvale Holtzer, 1898 manufacture; weight, 252 lbs.; striking velocity, 1,715 foot-seconds; energy, 5,144 foot-tons; point of impact, 21 inches from top edge of plate, 26 inches from impact No. 4, 26 inches from impact No. 3, and 18 inches from impact No. 1; penetration 5 inches. No cracks in plate; slight spalling off of face of plate; projectile broken and thrown to rear; plate and backing uninjured.

Sixth Round.—Projectile Midvale Holtzer, 1898 manufacture; weight, 252¼ lbs.; striking velocity, 1,821 foot-seconds; energy, 5,807 foot-tons; point of impact, 24 inches from top edge, 17 inches from right end of plate, and 14 inches from impact No. 1. Projectile penetrated and broken pieces lodged in plate and backing; the skin plate bulged but not cracked; slight spalling off of face of plate around shot hole; no cracks in plate although this shot was very close to the corner of the plate and to impact No. 1, and the backing supporting this portion of the plate had been badly splintered by previous shots.

Round.	Gun inch.	Velocity foot-seconds.	Weight of Shot.	Energy foot-tons.	Penetration of actual plate inch.	Factor above Dr. Marre formula.
1	8	1,520	250½	4,017	¾	1·37
2	8	1,623½	252½	4,619	2½	1·47
3	8	1,730	252	5,234	6¼	1·56
4	8	1,828	252⅛	5,847	Perforated.	1·65
5	8	1,715	252	5,144	5	1·55
6	8	1,821	252¼	5,807	*	1·64

Total energy ... 30,668

* Projectile broken up and lodged in backing.

The last column of the table gives the factor obtained by dividing the actual velocity by velocity calculated by De Marre formula for perforating steel plate of equal thickness.—*Iron Age.*

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS DURING JUNE, 1899.

Colonel St. J. F. Michell, I.S.C., from Assistant Quarter-Master-General in India to command a 2nd Class District in India, with the temporary rank of Brigadier-General whilst so employed. Colonel O'M. Creagh, V.C., I.S.C., from Assistant Quarter-Master-General in India to command a 2nd Class District in India, with the temporary rank of Brigadier-General whilst so employed. Colonel H. B. MacCall, C.B., to be D.A.G. in India, with the temporary rank of Brigadier-General whilst so employed. Major and Brevet Colonel N. F. F. Chamberlain, I.S.C., to be a Colonel on the Staff in India, and to have the substantive rank of Colonel in the Army. The under-mentioned officers to be Assistant Quarter-Master-Generals in India, and to have the substantive rank of Colonel in the Army :—Lieut.-Colonel and Brevet Colonel H. E. Penton, I.S.C. ; Major and Brevet Lieut.-Colonel J. E. Nixon, I.S.C. ; Lieut -Colonel J. W. Murray, R.A. Colonel S. C. Turner is granted the temporary rank of Major-General whilst employed as Director-General of Military Works in India. Colonel R. H. Murray, C.B., A.D.C., to be Colonel to command the 72nd and 79th Regimental Districts. Major-General P. J. C. Campbell to Colonel Commandant Royal Artillery. Major-General and Hon. Lieut.-General W. Rickman to be Colonel of the Royal Munster Fusiliers. Major-General and Hon. Lieut.-General R. S. Baynes to be Colonel of the King's (Liverpool Regiment). Brevet Colonel J. E. Josselyn, h.p., R.A., to be Colonel on the Staff for Royal Artillery, and to have the substantive rank of Colonel in the Army. Lieut.-Colonel E. Dickson, R.E., to be A.A.G. for Royal Engineers at Head Quarters, and to have the substantive rank of Colonel in the Army. The under-mentioned Lieut.-Colonels to be Colonels :—W. H. Young, the Bedford Regiment ; C. D. Cooper, Royal Dublin Fusiliers ; Lieut.-Colonel D. F. Lewis, C.B., employed with the Egyptian Army, to be Brevet Colonel.

HOME.—The Secretary of State for War has issued a circular stating that, as experience has now demonstrated that inoculation against enteric fever (Professor Wright's system) may afford a considerable measure of protection from that dangerous disease, the Secretary for War desires that all soldiers about to proceed to stations where the disease is prevalent, such as South Africa, India, and Bermuda, may be given the opportunity of being inoculated on their volunteering to undergo the operation. The following table exhibits statistics brought forward by Professor Wright, Army Medical School, Netley :—

——	Inoculated.	Sick.	Not Inoculated.	Sick.	Remarks.
Maidstone epidemic, nurses and attendants	84	Nil.	120	18	
India troopship, October, 1897, officers	22	Nil.	2	2	1 died.
India troopship, October, 1897, recruits	69	Nil.	—	—	
Nile Expedition, Lancashire Fusiliers, subalterns	6	Nil.	2	2	1 died.
Nile Expedition, R.A.M.C. ...	22	Nil.	—	—	

It is now suggested that all units and drafts when about to proceed abroad should attend a short lecture to be given by a medical officer, at which the advantages of the operation may be explained and the fact made known that the immediate effects are not more inconvenient than those produced by vaccination. Instructions will shortly be issued to principal medical officers, and in due course the means of inoculation will be supplied.

A Parliamentary paper has been issued containing two schedules showing the proposed expenditure under the Military Works Bill, 1899.

Schedule A, showing proposed expenditure under the Military Works Bill of 1899, is as follows :—

Defence Works			£1,000,000
Barracks—			
a. New Barracks for Artillery and Infantry at Salisbury Plain		£1,600,000	
b. Additions to depôts of regiments to which new battalions have been added, including—			
*Caterham	£10,000		
Bury	50,000		
Warwick	40,000		
Mill Hill	60,000		
		160,000	
c. Barracks for Garrison Artillery at Berehaven, Buncrana, Harwich, and Leith, and for a Field Battery at Exeter		70,000	
d. Additional accommodation for an increased Establishment of 80 men per battalion at Athlone, Belfast, Buttevant, Fermoy, Gosport, Holywood, Limerick, Portland, Portsmouth, and York		90,000	
e. Completion of work at the following barracks in progress under the Military Works Loan—			
*Ballincollig...	£25,000		
*Winchester	30,000		
*Woking	35,000		
		90,000	
f. Additions and improvements to existing barracks at—			
*Edinburgh	£25,000		
Tipperary	25,000		
Windsor	30,000		
		80,000	
g. Continuation of reconstruction of large camps in progress under Military Works Loan—			
*Aldershot	£100,000		
*Colchester	50,000		
*Curragh	50,000		
*Shorncliffe	30,000		
		230,000	
h. Barracks at foreign stations—			
*Gibraltar	50,000		
*Halifax	40,000		
*Malta	120,000		
Wei-hai-Wei	130,000		
*Bermuda, Jamaica, Mauritius, and St. Helena	90,000		
*Freight and local transport of stores	20,000		
		450,000	
			2,770,000
Rifle Ranges			40,000
Staff and Contingencies			190,000
Total			†£4,000,000

* The sums to be expended at these stations make up the total £675,000 of Head 2 (*a*) in the schedule to the Bill.

† No building will be undertaken which cannot be completed within the £4,000,000 asked for under this Bill.

Schedule B shows the complete War Office scheme to be as follows :—The total amount required for defence works is £1,306,000, of which amount £1,000,000 is to be provided in the Military Works Continuation Bill, 1899. The next item is £2,900,000 for barracks at the large camps of Aldershot Colchester, Curragh, Salisbury Plain, and Shorncliff, £1,830,000 being provided this year. For barracks at Athlone, Ballincollig, Belfast, Berehaven, Buncrana, Buttevant, Cork, Dublin, Edinburgh, Exeter, Fermoy, Gosport, Harwich, Kilkenny, Kinsale, Leith, Limerick, London, Mullingar, Newcastle, Norwich, Pembroke, Plymouth, Portland, Portsmouth, Tipperary, Windsor, Woking, Woolwich, York, and depôts and detached Militia headquarters at Barnet, Bury, Caterham, Chichester, Hamilton, Holywood, Maidstone, Mill Hill, Warwick, Winchester, as well as married soldiers' quarters at sundry barracks, the total amount required is £1,334,000, of which £490,000 is included in the Bill. The sum of £1,020,000 is required for the following foreign stations :—Bermuda, Egypt, Gibraltar, Halifax, Hong-Kong, Jamaica, Malta, Mauritius, St. Helena, Wei-hai-Wei, and for freight and local transport, the sum of £450,000 being put down to 1899. For rifle ranges the sum allocated is £40,000, the whole of which will be provided for in the Bill. Finally, £300,000 is required for staff and contingencies, and £190,000 is to be asked for this year. The total expenditure is £6,900,000, and of this sum £4,000,000 is to be raised under the Bill which will be introduced during the present Session.

The following is a description of the breech mechanism for the 3-inch Q.F. field gun :—

The breech mechanism is so arranged that, by one horizontal movement of the hand-lever, the breech plug is first rotated and unlocked and then swung out of the breech of the gun.

The arrangement consists of a link, one end of which is fitted on a pin on the face of the breech plug and the other end is pivoted to a short crank mounted on the carrier, and around the boss of this crank are formed skew gear teeth engaging into similar teeth formed round the boss of the hand-lever.

The firing gear, which is operated by the link, is made safe against firing during the first movement of the hand-lever, and the empty tube is automatically ejected during the opening of the mechanism. A retaining catch automatically prevents the tube from being jerked out when closing the breech.

To open the breech the hand-lever is swung away from the gun and by means of the skew gear wheels the crank is turned, thus moving the link and rotating the plug until it becomes unlocked. By continual swinging of the hand-lever the carrier with the breech plug are swung out clear of the breech of the gun.

INDIA.—The cordite factory on the Nilgiris is to be situated in the Arvanghat Valley, within a short distance of the Wellington Cantonment. A hundred acres of land are to be appropriated at a cost of 5,000 rupees, and the factory is to stand isolated in the midst of this area, so as to avoid the consequences of a possible explosion.

AUSTRIA-HUNGARY.—Two series of grand manœuvres will take place this year. The first, at which the Emperor will be present, will be in Bohemia, at the beginning of September, in the neighbourhood of Bohemian-Leipa. His Majesty will pass the months of July and August at Ischl, and it is from there that he will proceed, by Vienna, to the theatre of operations, at which all the troops stationed in Bohemia will assist, with the exception of those that it is absolutely necessary to retain for garrison duty. It is wished that the effective of the two army corps, the 8th and 9th, should be as high as possible. These army corps will manœuvre under the direction of their own commanders—General Fabini commanding the 8th, and Lieut.-General von Klohm the 9th Army Corps. The latter has only just been placed at the head of the 9th Army Corps in the place of General Emmanuel Mesta, who requested permission to retire from the Service. In addition to the

Emperor, the Archdukes Francis-Ferdinand and Rénier, the latter commander-in-chief of the Landwehr, will assist at the Bohemian grand manœuvres. The Landwehr itself will take a considerable part in the operations, for a Landwehr division will be incorporated with each army corps, as well as two divisions of infantry of the Line. It should not, however, be forgotten that in Austria-Hungary the Landwehr has a permanent existence, just as much as the Active Army, and that it only differs from the latter by the shorter period of service, two years instead of three, which the men undergo, who are incorporated in it after the drawing of lots. One cannot therefore compare this Landwehr with that of other countries. The Bohemian grand manœuvres ended, some days will elapse before the commencement of the second series about the middle of September. These will take place in the neighbourhood of Klagenfurt-Villach, and will be executed by all the troops of the 3rd and 14th Army Corps, which will be commanded respectively by Generals von Succovaty and von Hold. All the troops of these two army corps, actually stationed in Styria, Karinthia, the Tyrol, and Upper Austria, will take part in the operations, and will furnish a total of 35 infantry battalions, 13 Imperial chasseur battalions, 5 rifle battalions, as well as 3 Bosnian battalions, 14 Landwehr and 10 skirmisher battalions—in all about 80 battalions.

On the other hand, on account of the mountainous nature of the country where these manœuvres will take place, cavalry will be very sparingly represented. The Archdukes Francis-Ferdinand and Rénier will also take part in these, as in the Bohemian, manœuvres.—*Le Progrès Militaire.*

FRANCE.—On the 20th April last, a detachment of the 4th Spahis completed a distance of more than 100 miles in 24 hours. The group of scouts of the 2nd Squadron, consisting of 1 officer, 12 men, and 13 horses, left Gabès (in Southern Tunis) on the 20th at 1 a.m., to carry out the destruction of the station and railway at Graïlba, a railway station of the Sfax-Gafsa line, a distance of 50¼ miles from there. On the following morning at the same time the group re-entered their barracks.

There was no water at Graïlba, and the horses had consequently to be watered at a cistern about three-quarters of a mile from the station.

The total distance covered was therefore 102 miles.

The 4th Spahis, commanded by Lieut.-Colonel de la Panouse, is entirely recruited in Tunis; the men undergo an obligatory service of two years; seven of the men who did this march belonged to the last contingent and had just five months' service.

Some people maintain that the Arab horse, although very wiry for long marches at a walk, cannot endure the fatigue of a prolonged great pace. It is also asserted that the native saddle and pack are unsuitable for rapid marches. Captain Compain, commanding the 2nd Squadron, wished to test the truth of these general impressions. The colonel gave him authority to execute a forced march with his scouts. These were well mounted; their horses, all the same, being about the average of the squadron, for they were chosen independently of the mounts of the officers, non-commissioned officers, corporals, and trumpeters.

With these young men and with average horses, the lieutenant, the commander of the group, was able to travel 102 miles in 24 hours, under a hot sun and carrying the rations of men and horses, and finally to bring back his troop in good condition, ready to undertake the march again after a rest of seven or eight hours. The principal veterinary surgeon, then on his tour of inspection, wished to see the horses on the morning of their return; he reported that they were in a perfect state and thoroughly sound. The pack had left no marks, and the horses had carried it well, in spite of long and repeated trotting. These horses have continued, since then, doing their usual work.—*Revue de Cavalerie.*

The season has commenced when most of the Alpine troops are either executing, or are about to execute, their summer marches and manœuvres.

In the 14th Army Corps district the Alpine troops of the garrison of Grenoble are about to leave for the summer cantonments on the frontier. The 12th, 28th, and 30th Battalions of Chasseurs and the Alpine batteries do not return till the middle of September, with the exception of the 12th Battalion, which will remain at Embrun, being replaced at Grenoble by the 14th Battalion.

In the 15th Army Corps the 58th Infantry Brigade, which has its staff at Marseilles, commences its manœuvres in the Alps at once (23rd June). It will operate in the Roya Valley, between Valdeblore and the River Authion.

The three brigades of the 15th Army Corps, which have all sent on part of their effective to the mountains, will immediately commence brigade manœuvres.

The combined manœuvres will take place between the 16th July and the 10th August, between the valleys of the Var and the Vesubie, under the supervision of General Metzinger, commanding the 15th Army Corps.

Two reforms initiated by the new French War Minister have recently been formulated :—

1. Lieut.-colonels of all arms who seem from age and capability likely to attain to the higher ranks of the Army, and to exercise the command of troops of different branches of the Service, may be authorised by the Minister of War to go through a course of instruction with branches of the Service other than their own, on own application, backed by the favourable report of their immediate superiors and recommended by the Inspector-General. These courses will, as a rule, take place during the first two years of their attaining the rank ; they will last about six months, between the arrival of one class and the conclusion of the autumn manœuvres. Colonels will endeavour not merely to render the courses profitable to those interested, but also to make use of them for the instruction of the officers of the corps.

   Infantry, artillery, and cavalry officers will thus acquire, by practice, a tactical knowledge which will stand them in good stead later, in insuring a unity of action in the co-operation of the three arms.

2. Breadwinners of families, selected by commanding officers, in each of the two classes serving with the colours and having still one or two years to put in, will in future be released at the same time as the men proceeding to the Reserve of that year.

   Up to the present, although men of one year, in all categories, including supporters of families nominated through recruiting agencies, were released about the 20th September, those nominated by commanding officers, although the law was identically the same in respect to them, were retained with the colours until the very last day of the termination of their service, viz., until the 15th or 20th November.

—*Le Temps.*

The *Militär-Zeitung* states that at Mendon, near Paris, the trial ground of the French Ballooning Section, a captive balloon was recently allowed to rise to a height of 150 metres and then shot at with Lebel rifles. Most of the shots passed through the lower half of the balloon, but many of them went through the upper part. In spite of the many holes made in it, the balloon only descended slowly to the ground after a lapse of six hours. It is very evident that the light gas did not escape through the bullet holes made in the lower part of the balloon; and in order to make an effective impression on the upper half, a gun of greater calibre, and firing shrapnel, would be required. It would, however, be no easy task to hit a balloon travelling at some hundred metres from the ground, with shot from a large gun.

The following military race meeting, to be held at Boulogne-sur-Mer, is announced in the *Revue de Cavalerie* for the month of July :—

CONCOURS HIPPIQUE DU NORD.

At Boulogne-sur-Mer (Place de Capécure). From Friday, the 21st, to Sunday, the 30th July, 1899. Military meeting. Prizes consist of Gold Medals. Officers' chargers borne on the rolls of regiments, quartered in the district, and ridden by Officers of the Cavalry of the Line, of the Reserve, of Light Cavalry, or special branches of the Service, on the Active List, in uniform, and belonging to these regiments.

PRIX DES RÉGIMENTS.

1st Section.

Twice round the course, at least eight obstacles.

Horses ridden by Officers of Cavalry of the Line, of the Reserve, or specia branches of the Service. Four prizes, value 100frs. each ... ... 400frs.

2nd Section.

Horses ridden by Officers of Light Cavalry. Four prizes, value 100frs. each, 400frs.

Total ... ... 800frs.

The President and Committee have the power to transfer prizes from one section to the other, according to the number of horses starting.

PRIX DE CIRCONSCRIPTION.

Three times round the course, at least twelve obstacles.

Three prizes, value 200frs. each ... ... 600frs.
Four prizes, value 100frs. each ... ... 400frs.

Total ... ... 1,000frs.

PRIX DE CLÔTURE.

Twice round the course, at least nine obstacles.

First prize, value 300frs ; Second prize, value 200frs. ; Third prize, value 100frs.
Fourth prize, value 100frs. ... ... Total 700frs.

Grand Total ... 19 prizes, value 2,500frs.

GERMANY.—The Grand Imperial Manœuvres of the 13th, 14th, and 15th Army Corps will take place this year, between the 4th and 15th September, in the presence of the Emperor. At the commencement the fighting will be between the 13th (Wurtemberg) Army Corps and the 14th (Bavarian); the theatre of operations will be between Stuttgart and Carlsruhe. Finally, the 15th (Strasburg) Army Corps will be opposed to the two preceding ones, and will probably attempt a passage of the Rhine in full force.

The total effective of the troops taking part in the manœuvres will be 91½ battalions of infantry (of which 4 are rifles), 70 batteries, 97 squadrons, 4 pioneer battalions, and departmental troops in proportion. During the manœuvres the 15th Army Corps, which only consists of two divisions, very strong ones it is true, will have a third assigned to it. The Emperor with the headquarter staff, will reside at Strasburg from the 6th to the 15th September, and will stay at Carlsruhe for the two preceding days.—*Le Temps.*

An order of the Bavarian War Minister, dated 1st March, makes known under what conditions the grand manœuvres of the Bavarian army corps will take place in 1899 :—

1. The two Bavarian army corps will execute grand manœuvres in accordance with paras. 406 and 407 of the field service regulations (brigade, then division, and finally army corps manœuvres), taking into consideration the state of the crops as much as possible.
2. In the 1st Army Corps special cavalry manœuvres will take place, under the superintendence of the Inspector of Cavalry.

   With this object a cavalry division will be formed by the 1st, 2nd, and 4th Cavalry Brigades, a horse artillery group of the 1st Field Artillery Regiment, and a detachment of the 2nd Battalion of Pioneers: the regiments of the 1st and 2nd Brigades will be composed of 4, those of the 4th Brigade of 5 squadrons.

The troops named for special cavalry manœuvres do not participate, as a general rule, in the brigade and division manœuvres of their army corps; on the other hand, the provisional cavalry division will be attached to the 1st Army Corps for a period of three days for the army corps manœuvres. The divisional cavalry (1 squadron per division) for the 1st and 2nd Divisions will be furnished by the regiments of the 1st and 2nd Brigades.

3. The ballooning section will be attached to the 1st Army Corps.

4. The return of the infantry to their garrisons should take place, at latest, by the 30th September, 1899, the last day for the discharge of the men of the class completing their service.

The ministerial decision adds certain details with regard to paras. 1 and 2.

a. The 5th Division (the Bavarian Palatinate) will be left on the left bank of the Rhine.

The officers of the general staff will be attached, for the autumn manœuvres, to the staffs of army corps (or of the cavalry division) as staff or orderly officers. The period of their attachment will be regulated by commanders of army corps, or by the Inspector of Cavalry, in concert with the headquarter staff.

b. The time at disposal will be regulated in a manner to make the greatest possible use of the largest manœuvring grounds.

The 12th Infantry Brigade will execute independent brigade manœuvres.

c The tactical rides of general and superior officers of cavalry and horse artillery will be undertaken in conformity with the regulation of 30th January, 1893.

d. An instruction cavalry ride will take place in the 2nd Army Corps; the general commanding the army corps will have 2,500 marks placed at his disposal for that object.

e. In the districts selected for the manœuvres, as well as in the conduct of the operations, endeavours must be made to reduce, as far as possible, injury to crops.—*Revue Militaire.*

According to the *Allgemeine Zeitung* the manœuvres of the 2nd Bavarian Army Corps will take place on the 14th, 15th, and 16th September between Nabburg and Amberg.

Those of the 1st Army Corps (to which a provisional cavalry division is attached) will take place between the Isar and the Lech under the following conditions:—

14th and 15th September.—Manœuvres of one division against another.

16th September.—Combined army corps manœuvres against a skeleton enemy.

The Cyclist Union undertook, by order of the Minister of War, a trial of the transmission of despatches by cyclists between Strasburg and Frankfort-on-Maine, both going and returning. The total distance to be covered was 348 kilometres. The despatch was carried by a group of three cyclists from one relay to another. The despatch left Frankfort at 5.10 a.m., was delivered to General Kaemper at Strasburg by three lieutenants of the 138th Regiment of Infantry, who formed the last relief, at 12.27 p.m. All three left Strasburg ten minutes later carrying the reply, which was placed in the hands of Lieut.-General Stülpnagel, commanding at Strasburg at 8.15, the same evening. Thus the total distance of 348 kilometres was covered in fifteen hours.—*La France Militaire.*

Next in importance to building bridges over large or small streams, the chief work of the Engineer Corps of the German Army consists in preparing the way for an attack upon a fortification. Frequent practice is given in this branch of service, and finally it is carried out on a large scale at the great drill in storming breastworks which is held every autumn. In this drill each of the enemy's protected redoubts is finally taken by storm. Real fortifications are often stormed by a sudden charge, instead of by a formal siege, after the artillery of the besiegers has made a breach in the breastworks. At every attack an infantry division of engineers precedes, carrying with it the proper tools to remove all obstacles in the way of the attacking columns or to bridge any gaps over which they will have to pass, thus clearing the road so far as possible for them. Deep ditches generally form the chief hindrances to the attack. These are either filled with water or have barbed wire fences, caltrops, etc., placed wherever possible, so as to make them impassable. The engineers carry with them, therefore, specially constructed bridges for the purpose of bridging over the ditches for the attacking party. These bridges are from 26 to 32 feet in length, and require 16 men to carry them, eight on each side. Two other men placed at the end of the bridge hold it back by ropes fastened when there is a steep escarpment to descend. Each bridge consists of a strong ladder with a low railing on each side. A wooden roller, mounted on posts, goes with each bridge and is carried by two men.

This is set up on the edge of the ditch and serves as a support to the bridge at one end. The bridge is run over the roller till its end rests on the ground at the other side of the moat. The roller support at the near end also serves to raise the bridge sufficiently to clear the wire fence, which is generally placed on the counterscarp as an obstruction.

As soon as the bridge has been thrown across, two men hastily run over it and make the end fast so that it cannot slip off. The others then follow with hatchets, axes, etc., with which to destroy palisades, fences, mines, and the like. A floor of boards is usually laid for greater convenience of the infantry in the rear of the pioneer corps, and when there is time an incline leading up to the bridge is placed in position.—*Das Buch für Alle* and the *Scientific American*.

ITALY.—General Mocenni, formerly War Minister in the Crispi Cabinet, has published an article on Military Attachés at Embassies, in the *Rivista politica e letteraria*. The opinions of this general officer are worthy of attention, as he was himself Military Attaché at Berlin. General Mocenni proposes doing away entirely with military attachés; he thinks that the office is an anomaly, as the military attaché is more under the orders of the chief of the staff of the Army than those of the embassy to which he is attached; his duties must therefore frequently clash in a way to cause the greatest inconvenience. But the reason that General Mocenni alleges as the chief point of his argument is drawn from the very nature of the duties of military attachés.

The mission of a military attaché is a double one, and if on the one hand his duties may be exercised in the full light of day, there are on the other hand certain circumstances when this can not be so, when, for instance, he has to endeavour to find out something that the Army, to which he is attached, is trying to keep secret; as for example, if he imagines, or if he knows, that experiments are to be carried out with new arms, if new fortifications are being constructed, or if they are endeavouring to simplify and quicken their mobilisation. What are, in such cases, the limits imposed on the military attaché? What guarantee is there that in his zeal to serve his country, he does not pass the limits laid down for him by the principles of military honour, his own personal dignity, and the prestige of the Army that he represents? What guarantee is there that in exceeding his privileges, he does not commit some slight fault, some regrettable, embarrassing, and even dangerous imprudence?

General Mocenni then demonstrates that the military attaché, by living in constant contact with the officers of the staff of the Army to which he is attached, may without difficulty hear and see, particularly during manœuvres, things that they try to conceal from him.

"On these occasions the military attaché can estimate the degree of education, the instruction, and the military spirit of the Army. He can gauge its qualities and its defects; he can ascertain the aptitude of the different generals; he judges their intellectual and physical worth; he can rate the clearness of their judgment; he can even get to know with what degree of confidence the chiefs have been able to inspire their subordinates. The knowledge of these matters is far more useful to the foreigner, and far more hurtful to the Army, to whose detriment it has been collected, than material information, often incorrect, which is sold by agents and spies, who are always ready to deceive those who pay them."

For all these reasons General Mocenni asks for the suppression of military attachés, as their maintenance offers more dangers than advantages.

The opinion of the former War Minister of Crispi's Cabinet has the greater value, as he had under his orders Colonel Panizzardi, the military attaché in France, of whom so much has been talked about with regard to the Dreyfus affair.

The *Gazzetta Ufficiale* has published a royal decree, deciding the various objects that the communes are obliged to supply to troops from the 1st July, 1899; they are as follows:—

1. Means of transport.
2. Bread, rations, and forage.
3. Wood for burning.
4. Straw for bedding.
5. Quarters.

Commanders of detachments must pay the indemnity due for transport, as soon as the transport has been carried out. With regard to numbers 2, 3, and 4, they will be paid according to the market value in the commune, before the troops leave their billets. Finally, the indemnity for quarters will be paid monthly, or at the moment of the departure of the troops.

The Committee of the Chamber which is charged with the examination of the rough draft of the recruiting regulation has assembled and appointed General Dal Verme president. The reporter of the committee has been authorised to ask the opinions of the Ministers of War and of the Navy on the propositions formulated by the Committee. The chief propositions are the following:—

1. The exemption from service, in peace-time, to be given on condition of certain guarantees, to acknowledged natural children, when then they are only sons.
2. The exemption from service in peace-time to be given on condition of the payment of 50 lire for a certain number of years, to Italian citizens residing in countries beyond the sea.
3. The exemption from service in peace-time to be given to Italian missionaries living in the Levant and out of Europe.
4. The abolition of the military tax.

The discussion of the War Budget has begun in the Chamber of Deputies, and the expenditure provided for reaches the following amounts:—

1. ORDINARY.	Lire.
General Expenditure	2,409,540
Army Expenditure	222,560,460
Total	224,970,000

2 EXTRAORDINARY

General Expenditure	20,000
Army Expenditure	250,000
Fortifications and Defensive Works	1,200,000
Total	1,470,000
Grand Total ...	226,440,000

To get at the exact amount of the expenditure the sum demanded for the extraordinary credits, amounting to 14,560,000 lire (April JOURNAL) must be added. In consequence, the budget, in round numbers, amounts to 240,000,000 lire. It must be added that these numbers should be reduced by 39,500,000 lire to arrive at the annual expenditure Italy makes for her Army.

The reporter of the war budget goes into the question of the distribution of the 200,000,000 for Army expenditure, and arrives at the result that the maintenance of the four combatant arms requires an expenditure of 140,000,000, thus divided:—

	Lire.
Infantry	83,000,000
Cavalry	24,000,000
Artillery	28,000,000
Engineers	5,000,000

Consequently the infantry, alone, absorbs $59\frac{1}{4}$ per cent. of the total expenditure for the combatant arms; the remainder, about $40\frac{3}{4}$ per cent., is given up to the other three arms.

The reporter next compares the expenditure occasioned by the maintenance of each arm with the recognised efficiency of that arm in war-time, and he proves that if the numbers, given by experience, for losses occasioned in battle are admitted, viz., 75 per cent. of men put out of action by the rifle, 20 per cent. by artillery, and 5 per cent. by cavalry, it results that the infantry, with its efficiency almost quadruple, does not cost 20 per cent. more than the other arms put together. This proves once more that infantry is the arm that costs less in peace-time and produces the greatest results in war.

A report presented to the Chamber by General Afan di Rivera shows the average age of officers of the various combatant branches of the Army in each rank, and the average time passed in each rank.

Average Age.

Arm.	Colonels.	Lt.-Colonels.	Majors.	Captains.	Lieuts.	Sub-Lieuts.
Infantry ...	52	50	44	39	32	24
Cavalry ..	52	$50\frac{1}{2}$	$45\frac{1}{4}$	$39\frac{1}{3}$	$29\frac{11}{12}$	$23\frac{1}{4}$
Artillery ...	55	51	45	38	31	25
Engineers ...	55	51	45	39	31	25

Average Time.

Infantry ...	$6\frac{5}{12}$	3	$3\frac{5}{12}$	$11\frac{1}{4}$	$11\frac{1}{4}$	$3\frac{1}{2}$
Cavalry ...	$6\frac{5}{12}$	$3\frac{1}{12}$	$4\frac{3}{4}$	$11\frac{1}{3}$	$10\frac{5}{6}$	$3\frac{1}{2}$
Artillery ...	$6\frac{1}{4}$	$4\frac{3}{8}$	$6\frac{3}{7}$	$12\frac{11}{12}$	$10\frac{1}{2}$	$3\frac{5}{12}$
Engineers ...	$6\frac{1}{12}$	$4\frac{5}{12}$	$6\frac{1}{2}$	$13\frac{1}{6}$	11	$3\frac{5}{12}$

The law settling the organisation of the Italian Army has not been in force a year (it was dated 14th July, 1898), and they are already thinking of modifying it with regard to the cavalry, artillery, and engineers, in order to facilitate the

mobilisation of these arms. A project has actually been submitted to the Italian Parliament, and the Commission, whose duty it was to examine the project, have reported favourably upon it.

In maintaining the same total of officers in the cavalry, viz., 933, it is proposed to increase by 5 the number of the colonels and by 24 the number of the majors, and to decrease by 5 the number of lieut.-colonels, and by 24 the number of captains. The object of this measure is to have, in peace-time, a superior officer to take command of the Militia unit, which would be formed in the event of mobilisation. With the present organisation they are obliged to take the major commanding the depôt, at a time when he is indispensable, to ensure the proper execution of all operations concerning mobilisation. By increasing the number of colonels, all regiments will now be commanded by colonels, whereas at present five regiments have a lieut.-colonel at their head.

Regarding the artillery, the Commission propose to increase the number of officers from 1,684 to 1,706 (an addition of 8 colonels, 3 lieut.-colonels, 18 majors, and 3 lieutenants, and a decrease of 10 captains). The territorial artillery commanders are brought from 8 to 12 (one to each army corps), and the 78 companies of coast artillery are divided into 25 brigades instead of 22.

With regard to the engineers, the number of officers is brought from 554 to 570 (an increase of 2 majors, 7 captains, and 7 lieutenants).

These modifications will most probably be voted, and General Afan di Rivera warns Parliament that this increase is only the prelude to a more complete augmentation, when the adoption of artillery guns of small calibre will necessitate a complete re-organisation of the artillery.

ROUMANIA.—Officers leave the Service under the following new provisions:—

1. By discharge, on which they can never rejoin the Army.
2. By being placed on the unemployed list in the event of the disbandment of their corps, or on account of ill-health or private affairs.
3. On reaching the age limit.

As regards No. 3, the limit of age is as follows, viz.:—Captains 50 years, majors 54 years, lieut.-colonels 56 years, colonels 58 years, generals of brigade 63 years, generals of divisions 65 years.

As far as colonels are concerned these officers may be retained in the Service for three years beyond the age limit, if they are considered thoroughly competent at inspections and at autumn manœuvres. This is sanctioned by royal decree on the annual recommendation of superior officers supervised by a committee of inspector-generals, presided over by the Minister of War. Officers relegated to civil life by age limit remain for five years at the disposal of the Minister of War, and may be employed in the event of mobilisation and attached to the Militia staff or to the Landsturm, as well as utilised for the great annual concentration of troops. The provisions have a retro-active effect to the year 1895.

Majors and captains retired on a pension may be employed on recruiting duty; they then receive additional pay, and this latter, added to their pension, must not exceed the emolument they were in receipt of when on the active list of their rank.—*La France Militaire.*

RUSSIA.—The non-commissioned officer question in Russia is apparently a difficult one to solve, as the following extract from the *Neue Militärishe Blätter* shows:—

One would think that in Russia, with a four or five years' term of service, it would be an easy matter to form an excellent corps of non-commissioned officers, and to keep them for a sufficient length of time by means of re-engagements. But the first result is not always obtained, and the second is very rarely obtainable.

If the pay of the Russian non-commissioned officer is compared with that of other countries, one must admit that it is of the smallest, but, nevertheless, beside that of the Russian soldier it is so high, that a manifest desire to raise the position of the non-commissioned officer above that of the soldier is very evident. With regard to the pecuniary conditions of the country, the common man's want of necessities plays a great part. The feeding is, however, excellent.

On account of the indisposition in Russia to remain in the Army on the expiration of the legal term of service, the authorities are forced to recruit non-commissioned officers from amongst those men whom the law compels to serve for the longest period, viz., four years in the infantry and five years in the cavalry. These are, however, just the men who have had little or no education. It is true that an allowance of 10 kopecks a man is given to teach them to read and write, but however great care may be taken with their teaching, it cannot supply the absence of primary education. After a year's service six or seven men are selected in every company, who from their physical and moral attributes are likely, later, to become non-commissioned officers. The men so selected from the different companies of a regiment (an infantry regiment has four battalions of four companies each) are formed into a squad for instruction, and leave their companies altogether whilst undergoing their course of instruction.

This squad, for whom the best officers and non-commissioned officers of the regiment are chosen as instructors, remain together from the 1st October to the end of April, viz., about seven months; not counting the numerous Russian holidays, the actual course of instruction is seldom more than 180 to 190 days. This time is sufficient to prepare the pupils, from a theoretical and practical point of view, as instructors of the soldier, but it is not enough to allow them to acquire the qualities that a commander should possess, such as confidence in himself, force of character, and a deep-rooted sense of duty.

Their course finished, these men rejoin their companies and take part as corporals or soldiers, in the camps of exercise; on the departure of the men for the Reserve, with whom nearly half the non-commissioned officers leave the regiment, those who have shown ability are made non-commissioned officers. They have then two years' service and have still two years to serve.

By this time half of the men of the company have more service than the new non-commissioned officers; if therefore these latter are not gifted with an enormous amount of tact, their position with regard to the old soldiers, who look on them more or less as recruits, is not an easy one; a quarter of the men of the company commenced their service at the same time as these young non-commissioned officers, and are only too apt to regard themselves as their equals; and the remaining quarter of the company, viz., the recruits, are not at all likely, either, to support the young non-commissioned officers.

As long as the new non-commissioned officers perform their duties under the eyes of the officers their authority is upheld, and they do good service to the company; but when they have to act independently, and perform any duty on their own responsibility, the necessary confidence and authority are wanting. This want is most felt in matters of interior economy when the officers are unable to exercise permanent supervision. When the commander of a company has managed at last, with the greatest trouble and most indefatigable zeal, to make these young non-commissioned officers a real help to him—they leave the Service. Each year the same grinding work has to be begun afresh.

Attempts have been made during the last few years to improve the material position of re-engaged men during their term of service, and to procure them, at the time of their departure, suitably remunerated civil employment, or to lighten their existence by a gratuity or pension. During the period of his re-engagement a sergeant-major receives an extra annual allowance of 84 roubles, the non-commissioned officer one of 60 roubles. The extra pay amounts to three or four times their salary, and may therefore be regarded as a very considerable increment.

On leaving the regiment non-commissioned officers who re-engage for five years receive a certificate of recommendation for employment in certain civil or military Government situations; after a re-engagement of 10 years they receive a gratuity of 250 roubles, and after 20 years (after 25 years' service according to some accounts) a bounty of 1,000 roubles or a life pension of 96 roubles a year, which on the death of the pensioner is continued to his widow at the reduced amount of 36 roubles a year. These advantages given to re-engaged men, although not so high as in Germany, are, nevertheless, very considerable; they do not suffice, however, to provide a sufficient number of good non-commissioned officers remaining in the Army on the expiration of their legal term of service. In spite of the increase of the Army, the number of re-engaged men diminish each year, not in the total number alone, but in each branch of the Service. It is with difficulty that half the companies or squadrons manage to have re-engaged sergeant-majors.

A Russian author (Surmenew) points out as the reason for this singular state of affairs the fact that the Russian people regard the re-engaged men as species of mercenaries, and despise them to a certain extent, and that therefore soldiers who have served their term with pleasure and the greatest zeal cannot be retained in the Service by means of any pecuniary advantage whatever. Although this motive explains, more or less, the dearth of re-engaged men, it certainly does not appear to be conclusive. One would be more like to suppose that the certificates of recommendation for obtaining special civil or military Government employment are not always as efficacious as could be wished, or that the employment does not always come up to the expectations of the re-engaged men.

An article in the *Razviédtchik* gives some interesting details of the position, in Russia, of officers of the general staff; it shows, firstly, the position of an officer of the general staff with regard to that of other officers; secondly, the special privileges which are accorded him with regard to promotion; thirdly, his material situation.

1. From the *rank* point of view, the officer of the general staff finds himself in a not too favourable position. Up to 1884, he derived a certain advantage of seniority, which has since been abolished; his special rank then placed him between the officers of the Old Guard and the ordinary Army officers, and on a level with the officers of the special branches of the Service (the artillery and engineers). This slight privilege exists no longer; the officer of the general staff has not now his special heading in the Army List, but finds himself ranked amongst the ordinary Army officers. Such a state of things would appear abnormal if one considers that the Guards officers, on the other hand, preserve their advantages: they are placed at the head of the Army, just as in remote times when there were no military schools, and when knowledge, culture, and education were possessed in an almost exclusive degree by officers of the Guards.

2. Up to 1885 the promotion of officers of the general staff was conducted in accordance with the following rules:—From the subaltern ranks after at least two years passed in the lower rank; for the transition from the rank of captain to that of lieut.-colonel (in Russia there are no majors), about three years; for promotion from lieut.-colonel to colonel, about three years. This was about the normal rate of promotion in most of the other branches of the Service.

Nowadays, the promotion regulations are more severe; it takes six or seven years for a captain to become a lieut.-colonel; and 4 for a lieut.-colonel to become a colonel; this, too, is the minimum.

The first effect of this delay in promotion is found in the fact that amongst the generals of brigade, who have sprung from the general staff, 23 are over 58 years of age, and fall under the limit of age clause, and it is therefore impossible for them to aspire to higher rank. Other obstacles are also placed in their careers

to disgust officers of the general staff and to render a service hard which is already exacting and difficult.

In addition, promotions are not made with that regularity which respects all rights and even all susceptibilities. It is made by selection, in a somewhat arbitrary manner, and which is keenly resented by a body of men who flatter themselves that they are quite homogeneous, and who have, besides, the greatest respect for seniority, which is regarded as absolute throughout the entire Russian Army. Officers of the Guards, on the other hand, enjoy, together with their own special advantages, others that are conferred on them by the Nicholas Staff College. For instance, one sees a cornet of the Cavalry of the Guard enter the Staff College, become a lieutenant there, and receive the privilege of leaving the college with the rank of Second Captain (*chtab-rotmistr*). The moment he passes into the general staff he becomes a captain in his regiment, viz., captain in the Guards, which confers on him the rank of lieut.-colonel in the Army. He thus finds himself, after only 6 or 7 years' service, senior to all the captains of the general staff.

Before 1896 the officers of the general staff had a right to look forward to the command of a battalion; now they can only command regiments, naturally as colonels. Thus, after 18 or 20 years of sedentary life, they return to active service on foot and on horseback.

3. The material situation of officers of the general staff corresponds but little with the special importance of their duties. It is regulated for them as for other officers by questions of employment and rank; thus, a captain of the general staff may be lodged at the same rate as a simple lieutenant if the former is on duty with corps troops with a divisional staff, and the latter is a regimental adjutant.

The comparison is equally disadvantageous if one compares the general staff with any civil administration under other ministers. Whereas pay to the amount of 250 and even 400 roubles a month are given to excise officers, the officer of the general staff only receives 100 roubles. He has to wait for 35 years for an increase to 250 roubles, which is given to many men before they are 30 years of age.

The annual census of horses is regulated in Russia by a new law, enacted last year. It refers only to horses of superior size, to the exclusion of farm horses, which are exceedingly weedy animals and which are not strong enough for any other work than that entailed by ordinary Russian husbandry. The object of the census is to ascertain the number of horses which, in each district government, the population could put at the disposal of the troops, to complete them to their proper strength, at the moment of a mobilisation. This horse question is still in its infancy in Russia, and they do not know, as a rule, the particular resources respectively of—firstly, the larger rural estates; secondly, the country populations; thirdly, the village populations. There is no precise information about the stud produce, the horse trade, or the average sanitary condition of the animals. The census of the current year took place in the 15 district governments of Central and of Oriental Russia. The chief interest of the operation consists in the fact that the region explored this time is that in which the famine has made such terrible ravages, and the consequences of that scourge will have to be considered with regard to the numbers and the state of the horses.

The census will also be taken in the Caucasus. There too, above all, the information to be gathered will be novel and instructive. For this year horses aged at least 5 years and of a minimum height of 12 hands have been assembled for the use of the artillery and military train. Hitherto the assembly of the animals has been made without any restrictive condition, so that all horses, without exception, have been brought before the veterinary board; and thus villages were for that time entirely without horses, and consequently without any means of transport. These horse mobs were very characteristic of the imperfect conditions

under which administrative operations are conducted in the Caucasus, but this year will probably see the last of them, to the great relief of the population and to the more effective preparation of mobilisation itself, which could not be otherwise than hindered by the temporary monopoly of horses in a country where the horse is the sole means of transport.—*Revue du Cercle Militaire.*

The *Revue Militaire de l'Etranger* recently published a most interesting study on the Russian Grand Imperial Manœuvres of 1898. The article concludes with some observations, of which the following are extracts:—

"The infantry showed, as usual, a remarkable endurance, in spite of the unaccustomed heat during the day and the coldness of the night bivouacs. Its discipline, too, was excellent. Volley firing was most frequently resorted to, and with regard to fire discipline the Russian soldier appears to have little to learn. On the defensive the Russian infantry makes frequent use of shelter trenches, the result of experience gained in the war of 1877–78.

"The cavalry still shows a certain tendency to dismounted fighting, and does not always make use of that rapidity of movement of which it is capable. It must, however, be observed that the country to the north of Niva, on account of its marshy nature, lends itself but little to any movements except by roads. Nevertheless, on the last day of the manœuvres, the cavalry of the Southern Army Corps supported brilliantly a counter-attack of its side, proceeding from one wing to the other, at the decisive movement.

"The artillery is very well handled, and comes into action with remarkable rapidity. It is always in close combination with the troops to which it may be attached, whether infantry or cavalry.

"One knows that, during peace-time artillery brigades are attached to infantry divisions and groups of horse artillery to cavalry divisions; corps artillery no longer exists. During their stay in camps of instruction the three arms continually manœuvre together, commencing with small detachments, and ending with units of the greatest importance, such as mixed brigades or divisions. These small manœuvres have the happiest effect on the instruction of the troops, and especially in the case of superior officers, who come to the grand manœuvres very well prepared for their *rôle* of commanding detachments of all arms.

"In short, the grand manœuvres of 1898 show that the Russian Army, easily and abundantly recruited in steady and disciplined men, continues, unceasingly to perfect its instruction, taking as the guiding principle of its works the maxim of Suvorov, viz.:—'One only does well in war what one has been accustomed to practise in peace-time.'"

The programme for the summer assembly of troops of the Russian Army is elaborated by the staff of each district and submitted for the Imperial approbation, with the exception of the Irkutsk and Amour districts, which, on account of their distance, lay down their own programme for the employment of the troops of which they consist. The district staffs are guided by regulations and limited by the credits assigned to them for the movements of troops. The credits were granted to the districts in 1896 by the headquarter staff, with reference to their effectives and the distances they had to traverse. But they are not fixed, and are raised every year in consequence of the increase of troops and the continual development of grand manœuvres.

The summer assemblies commence, as a rule, on the 1st May and terminate on the 1st September. But climatic conditions, so varied in the vast Russian Empire, frequently necessitate the modification of these dates. Thus, in the Trans-Caspian and Odessa districts they begin in the middle of April, and in Turkestan they end in the middle of September.

The summer assemblies are divided into:—1. Assemblies of units. 2. Special assemblies. 3. General assemblies.

1. The assemblies of units commence about the 1st May. The infantry are collected first by regiments, then, for musketry purposes, they concentrate in brigade or division camps of exercise, which are always situated not far from the places fixed for the general assemblies. The greater portion of the cavalry assemble first by regiments and make use of the nearest infantry ranges for musketry. The artillery first get ready on the spot for combined action with the other arms.

2. The special assemblies for artillery take place, as a rule, during the months of May and June. They last, actually, nearly two months, on account of the great development given to the preparatory firing exercises. For gunnery instruction, most of the batteries (96 per cent.) assemble at the district camps of exercise, of which there are four in the Kiev district, three in those of Vilna and Odessa, two in those of Varsovie and Caucasus, and one in the other districts. The most important artillery assemblies take place this year at Rembertovo for 76 batteries; Krasnoé-Sélo for 52 batteries; at Orang for 40 batteries; and at Brest-Litovsky for 33 batteries.

The *personnel* of the garrison artillery go through their shooting at the places they are quartered in, with the exception of Kovno, Varsovie, Zégrje, and Dubno. The artillery of these places go to the nearest camp of exercise for that purpose.

The special assemblies of cavalry with its horse artillery take place in about 80 per cent. of all the cavalry corps. The most important are those of Orang, 60 squadrons; Krasnoé-Sélo, 55 squadrons; Varsovie, 49 squadrons; Mejiboujie and Skernevitzy, 48 squadrons. They take place in June, July, and the beginning of August, and in the Varsovie, Vilna, and Moscow districts in the month of September.

The engineers assemble by brigades in the districts of St. Petersburg, Kiev, Moscow, and the Caucasus. The pontoon battalions go through their drills on large tracts of water at Vilna, Varsovie, and Odessa, independently of the engineers.

The garrison engineers usually remain where they are quartered, but some engineer units are called out to take part in certain artillery exercises, to take note of the effects of projectiles and to organise entrenchments sufficient to afford shelter to the troops.

3. The general assemblies of the different arms for combined manœuvres always last for four weeks, and include, at least, an infantry division with its artillery, and a brigade of cavalry. With the increase of the Army the necessity of organising as much as possible the concentration of larger masses has been recognised, and during the last 10 years considerable progress has been made in this respect; for whereas in 1889 only 27 per cent. of the divisions took part in the general assemblies of army corps of two or more divisions, the numbers in 1899 are already 50 per cent. Of the four weeks given up to the general assembly, two are usually employed in small or march manœuvres executed each day on a different ground, which gives greater interest to them.

The general assemblies take place in 77 different parts of the country, and 40 of these assemblies terminate in march manœuvres or even in grand manœuvres. The duration of the manœuvres vary according to circumstances. Thus, in the Omsk district they only last for five days on account of its weak effective, whilst in the Kiev, Vilna, and Caucasus districts, where troops from different camps march against one another, then unite for combined manœuvres and form masses of two or three army corps, the period of these movements lasts for 20 days at Kiev, 16 days at Vilna, and 19 days at the Caucasus. In the Varsovie district they last for 17 days.

The manœuvres generally take place in August; but in the Trans-Caspian and in Turkestan, the heat necessitates their postponement till the beginning of September.

The troops taking part this year in the general assemblies include 87 per cent. of the infantry, 89 per cent. of the cavalry, and 95 per cent. of the artillery, which gives 35 battalions, 16 squadrons, and 38 batteries more than last year.

The units taking part in the general assemblies and in the grand manœuvres amount to a total of 665 battalions, 413 squadrons, and 324 batteries, or 55 per cent. of the infantry, 61 per cent. of the cavalry, and 61 per cent. of the artillery.—*La France Militaire.*

Of the four Caucasian field infantry divisions (including the Grenadier Division), three, viz., the Grenadier, the 20th, and the 39th Divisions, have hitherto belonged to the Caucasian Army Corps. The 21st Division was an independent one, and was not included in the army corps. According, however, to an order of the 3rd April last, the Caucasian Army Corps now hands over the 20th and 39th Divisions for the formation of a new army corps, to be called the 1st, with its headquarters at Alexandropol, whilst the Grenadier is joined to the hitherto independent 21st Division, and forms the 2nd Caucasian Army Corps, with its headquarters at Tiflis. Each of the two Caucasian army corps will, therefore, in future, consist of two divisions, as in the European army corps; an independent division will no longer be maintained in the Caucasus. An artillery brigade, with its park, is attached to each infantry division. The 1st and 2nd Caucasian Cossack Divisions, with two Cossack batteries, are attached to the 1st Caucasian Army Corps and the hitherto independent Caucasian cavalry division, also with two Cossack batteries to the 2nd Caucasian Army Corps. An essential difference in the composition of the Caucasian and the European army corps lies in the fact that colonial troops are included in the effective of the former; thus the 1st and 2nd Kuban-Plastun Battalions belong to the 1st Caucasian Army Corps, and the Caucasian Colonial Brigade with the native colonial brigades (both hitherto independent), as well as the Caucasian colonial artillery group to the 2nd. Consequently all the existing field troops in the command, with the exception of the engineer brigade, are included in the two army corps. In addition to these there now only remain the infantry reserve troops with their artillery.

In peace-time there are 4 reserve brigades, of which 2 have an effective of 4 regiments of 2 battalions of 4 companies each, and 2 have only 1 of 4 battalions of 5 companies each.

In war-time these are increased to 4 divisions. The first organisation consists of 4 regiments of 4 battalions and in addition 2 divisions, the second organisation is of the same strength. In addition, out of 2 hitherto independent reserve battalions, 2 regiments of 5 battalions each would be formed. The Caucasian army then, at its full war strength, excluding the colonial troops and including the Kuban-Plastun battalions, has at its disposal over 10 divisions of infantry. The want of cavalry in case of war is more than amply provided for by the 2nd and 3rd levies of the Caucasian Cossack regiments.—*Militär-Wochenblatt.*

SPAIN.—General Polavieja, Minister of War, has submitted a plan for the re-organisation of the Army to the Cortes, of which the following are the chief provisions:—

Military service will become obligatory for every Spaniard, the replacing o. recruits by substitutes being abolished. A military tax has been established for the various categories of exempts provided for by the new law.

The recruiting zones (recruiting offices) are raised from 65 to 120; each zone includes the staff of two battalions of infantry reserve: one of the first, and the other of the second reserve. The reserve units of other arms are only subject to slight modifications; nevertheless, 10 battalions of reserve garrison artillery have been formed. Each of the 64 regiments of infantry and the four engineer regiments of the Active Army include the staff of a third battalion. Each battalion has only three companies.

The eight army corps are called captain-generalships; besides this the actual territorial repartition allows of no change. The troops of the Peninsula

are grouped in 15 infantry divisions (the 5th Division, that of Saragossa, has only 1 infantry division), 1 division of cavalry, and 4 cavalry brigades. The infantry division consists of 4 Line regiments, 1 battalion of riflemen, 1 regiment of mounted chasseurs, 1 regiment of field artillery, 1 administrative, and 1 hospital company.

Of the 20 battalions of riflemen, the five which are not brigaded become infantry mountain battalions; these are, Reus No. 16, Chiclana No. 17, Vergara No. 18, Talavera No. 19, and Alcantara No. 20. These battalions will be numbered 1 to 5 in the above order and will occupy the mountainous zones of the Sierra de Gata, in the 1st Region, of the Serrania de Ronda, in the 2nd Region, of the Pyrenees in the 4th, 5th, and 6th Regions, a battalion to each region. A special regulation will appear on the subject of these new troops, which will keep the organisation of rifle battalions.

Many other reforms are contemplated, but they are too numerous to specify before they have been discussed.

On the 2nd June last in her speech from the throne the Queen-Regent notified to the Cortes that the Government was about to submit to them a project for the ceding to Germany of the Caroline, Pelew, and Marianne or Ladrone, Islands, which belong to Spain. According to the Spanish military journals, the cession of these islands will be consented to in exchange for 25 million francs. Spain will keep possession of the submarine cables she has at various points, and will have the right to establish a coaling station (of which Germany insures the protection) in each of the three groups of islands. Germany will, in addition, respect the religion and customs of the Spaniards residing in the Caroline, Pelew, and Marianne Islands, where Spain will always enjoy the treatment of the most favoured nation. These conditions are favourably regarded in Spain, where they think that it is more inconvenient than advantageous to keep such distant possessions.—*Revue du Cercle Militaire.*

SWITZERLAND.—The report for 1898 of the administration of the Federal Military Department has recently been published, and the following is some of the information contained in it :—

During the year 1898, 17,174 recruits were exercised, viz. :—

	Recruits
In the Infantry	13,732
,, Cavalry	525
,, Artillery	1,818
,, Engineers	491
,, Medical Department	442
,, Administrative	166
Total	17,174

The number exercised in 1898 was less by 580 than those exercised in 1897. The recruiting statistics of 1898 show a total of 17,851 enlisted men; in 1897 they were 18,339; here, too, is a falling off from the preceding year (448 men).

The men recruited in 1898 for the year 1899 were divided as follows :—

a. BY DIVISIONAL DISTRICTS.

	Men.
1st Divisional District	2,460
2nd ,, ,, ...	1,841
3rd ,, ,, ...	2,264
4th ,, ,, ...	2,051
5th ,, ,, ...	2,465
6th ,, ,, ...	2,492
7th ,, ,, ...	2,175
8th ,, ,, ...	2,103
Total	17,851

b. By Various Arms.

	Men.
Infantry	13,944
Cavalry	544
Artillery	2,143
Engineers	528
Medical Department	523
Administrative Department	169
Total	17,851

According to the rolls of the 1st January, 1899, the effective of the Federal Army was as follows :—

	Men.
Staff	1,125
Active Army	148,435
Landwehr	85,676
Total	235,236

At the same date the rolls of the Landsturm numbered 275,596 men.—*Revue Militaire Suisse.*

United States.—The report of a Board of Ordnance officers appointed to inquire into the experiences of our troops serving in the campaign against Santiago with the arms and ammunition furnished them shows the 45-calibre Springfield and black powder have no friends left among those who had experience with them in Cuba. It is difficult to understand, therefore, the tenacity with which our officers in the Philippines appear to cling to them, refusing, according to the reports received from the War Department, to accept new guns offered to them, and which were accordingly stopped *en route* at Benicia Arsenal. Possibly the use of the black powder may account for the excess of casualties among the Volunteers at Manila, which is contrary to experience. Doubtless our officers find that the bullet from the large calibre is more effective, and as their universal practice is to close with the enemy the additional range of the Krag does not count if its flatter trajectory does. But the black powder must have been responsible for many casualties.

The Ordnance Board reports that the 30-calibre rifle and its ammunition have given complete satisfaction in service in Cuba. Not one cartridge was reported defective, and the breech mechanism stood the severest possible test. In rare cases the rear spring failed to retain the cocking piece in the withdrawing position. The cut-off and safety lock broke in a few cases, but these parts are to be strengthened.

Rifles and carbines were used almost entirely as single loaders with the magazine in reserve. There was only one complaint of any difficulty in charging the magazine, though several officers expressed their desire for a clip or other means of carrying a portion of the cartridges in some form of packet from which the magazine could be directly charged

It is probable that this will be obtained by the adoption of the patent clip recently described here. It admits of feeding five cartridges into the magazine instead of one by one, and it is proposed to so alter the cartridge by removing the rim that this number can be increased to six. Without exception, every officer stated his preference for the 30-calibre rifle to the 45-calibre Springfield, even with a smokeless-powder cartridge.

The addition of a proper drift correction and wind gauge to the sight is essential. The lug on the gate of the magazine should be hardened, the hook of the bayonet scabbard and the rear spring strengthened, the bayonet much sharper, the haversack enlarged, a range-finder provided and an oiler provided for each soldier. Objection is made to the blueing of the cut-off, to the tendency of the cartridge belt to drop cartridges, and to the time and appliances

required to open them. The canteen strap cuts the shoulder, and should be made more like the haversack strap.

The blanket bag was not used at all, and all the officers were of the opinion that it was useless for field service, and that a blanket roll was preferable, and all that was necessary. In barracks the blanket bag is occasionally a useful valise for holding the soldier's spare clothing. The haversack will hardly hold two days' rations, and is therein defective, as the troops were called upon to carry a greater supply. A few officers favour an oilskin lining, to prevent absorption of grease from bacon.

There were no adverse criticisms of the 3·2-inch rifle by the artillery. In one battery, Parkhurst's of the 2nd Artillery, the breech mechanism of one gun, when much heated, worked with some little difficulty, which disappeared when the parts were allowed to cool. In some rifles the copper vent bushings were blown out in action, and this the Board considers the only serious defect developed in breech mechanism. The gun carriages behaved well in action.

The shrapnel gave general satisfaction, though there was one instance of a shrapnel breaking up in the gun.

The use of black or smoke powder was universally condemned by every officer revealing as it did the position of the guns to the enemy. The Spanish batteries used smokeless powder, and the position of their guns could consequently not be determined. Artillery officers had no failures of fuses to report. So far as could be seen, all time fuses caused the shrapnel to burst in air, apparently at the proper range; and the base percussion fuses operated satisfactorily.

For the artillery the peep hole in the service sight should be enlarged, though this will be at the expense of accuracy. The lantern attachment should be discarded, the clevis shank of the bow spring to be lengthened, a bent socket wrench provided for the nuts under the crank securing the ammunition chest, the ferrule joint of the sponge and rammer staff lengthened, and made of non-rusting material, the screw-eyes for the primer boxes should be made to be easily unscrewed and provided with a securing device, the securing chain hooks on the singletrees and the butt of the collar lock strengthened, the whip shortened.

The breech covers wear out very easily, and it is thought it is due to the paint weakening the canvas. All the compartments in the trail should have floors and covers if found practicable in construction. The connecting rod for the caisson road break is too weak, and the shoe is too soft. Both defects should be remedied. The pole prop and its attachment to the pole are not sufficiently strong and stiff to support the pole when the harness is placed thereon. The grease can leaks at the sides, due to the soldering giving way. This should be remedied in future construction. A leather case should be provided for the sperm oil can. In Taylor's Battery a leather hood was made which enclosed the hub of the wheel, and prevented dust from reaching and running parts in that location. A leather collar was also used, which, embracing the axle body, prevented dust from getting into the running parts between the wheel and the axle body. The hood also prevented linchpin from dropping or being broken going through brush. The introduction into the Service of these or similar devices is recommended. The wearing of the rings attached to the singletrees and doubletrees is considerable, and if practicable should be remedied. The ammunition chests should be provided with additional hooks to suspend the locks when the chests are unlocked. The amount of harness supplies and cosmoline should be increased by one-half. The Board desires to report that, taken as a whole, the entire ordnance equipment for artillery, cavalry, and infantry, including ammunition, with the exceptions noted, stood admirably the test of the most severe field service, and received high commendation from officers who closely observed it on the march and in action; and the Board is of the opinion that with the changes recommended it will be entirely satisfactory.

The inaccuracies of statement concerning the Springfield rifle contained in some of the comments in the daily papers, upon its use in the Philippines,

seriously lessen the force of their criticisms. Our old Army gun is no longer a smoke-belching volcano. Smokeless powder cartridges for use with it were forwarded to General Otis sometime ago. There are points in favour of the Springfield that are not overlooked by the War Department. Its simplicity and security from getting out of order under the roughest usage make it especially valuable to new troops. As far as rapidity of fire is concerned, there is probably little to choose between the old and the new gun.

The English have found their small-calibre bullets ineffective against a savage enemy that does not understand the rules of the game and will insist upon fighting after being hit, and hit more than once. It is a fair subject for discussion, therefore, whether the Springfield is not more effective against a savage foe than the Krag or the Mauser.

The shock or blow from the bullet of the 45-calibre rifle is much greater than from the lighter bullet of the magazine rifle. Many cases of unofficial statements have reached the Ordnance Department of the inefficiency of small-calibre bullets fired with high velocities, because of their failure to produce the shock necessary for disabling an enemy, and of the greater efficiency of the 45-calibre arm in this respect. General Corbin himself has expressed the belief that "it is possible that in the firing likely to occur in country thickly wooded or with dense undergrowth, as in the neighbourhood of Manila, the Springfield rifle with the smokeless cartridge, is the more efficient weapon."

There is a widely spread impression that 1,000 yards is the range of the Springfield, whereas it has a range of about 3,600 yards, and that of the Krag being about 4,200 yards. At long range there is an apparent superiority in favour of the magazine rifle, and, in addition, owing to the smaller diameter of the bullet, the trajectory of the magazine rifle is much the flatter of the two. To provide a smokeless powder charge for a rifle chambered for the black powder charge of double weight and limited to a pressure not to exceed 24,000 lbs. per square inch, has taxed the ingenuity of our ordnance officers to the utmost. The conditions of the problem made it impossible to secure a powder as free from smoke as that used in the Krag or the Spanish Mauser, but it appears to answer the purpose. Though the Springfield is classed as a short-range gun, its energy at a mile and three quarters is in the proportion of 100 foot-pounds to 50 for the U.S. magazine rifle. Then again, the danger undergone at that range is not so much in favour of the magazine rifle.

From the landing of General Anderson's first military expedition, near Cavite, on June 30th, 1898, to the last weekly report from General Otis, dated June 6th, there were only 364 deaths from disease, although his total force has been 40,000 men. In the same period 69 men have died from wounds

In view of the unhealthiness of Manila and its environs these figures are almost incredible. Death reports from General Otis come weekly. All are given out promptly to the Press. Not only the names of the dead are given, but in every instance the disease. Men drowned or who died from injuries received otherwise than in battle are counted in the total of 364 mentioned above. This total is interesting, compared with that of the men killed outright in action with the Filipinos from February 4th to June 6th, covering the period of active hostilities. In those four months, with an average of 7,000 men engaged, the killed were 226. This demonstrates what improvement has come from the experience of the Santiago campaign, when 2,000 men died from disease and only 260 were killed. The Army surgeons have profited wonderfully, the commissary is no longer an experiment, and the men have learnt how to take care of themselves. The health record at Manila shows that discipline of the highest order has been rigorously secured and that men have come to regard their health as the first fighting requisite. In fact, the health question of the Philippines has apparently lost its novelty, and no question has been raised about it.—*U. S. Army and Navy Journal.*

NAVAL AND MILITARY CALENDAR.

JUNE, 1899.

1st (Th.) Launch of the first-class battle-ship "Kaiser Wilhelm der Grosse" from the Germania Yard at Kiel for the German Navy.

2nd (F.) 2nd Bn. Duke of Cornwall's Light Infantry returned to Devonport from their march through the County of Cornwall.

,, ,, Spain cedes the Caroline, Pelew, and Marianne Islands to Germany.

3rd (Sat.) The Court of Cassation quashed the former court-martial and ordered Captain Dreyfus to be brought before a fresh court-martial.

,, ,, H.M.S. "Basilisk" paid off at Sheerness.

4th (Sun.) H.M.S. "Immortalité" arrived at Plymouth from China.

6th (T.) H.M.S. "Pallas" arrived at Portsmouth from North America and West Indies.

8th (Th.) Vote of thanks awarded by both Houses to Lord Kitchener and the Anglo-Egyptian troops for the late Soudan campaign.

,, ,, H.M.S. "Endymion" commissioned at Chatham for China.

,, ,, Launch of first-class armoured cruiser "Jeanne d'Arc" from La Seyne, Toulon, for French Navy.

,, ,, Launch of torpedo-aviso "Hallebarde" from M. Normand's Yard, at Havre, for French Navy.

9th (F.) Captain Dreyfus left the Île du Diable, in the "Sfax," for Brest.

10th (Sat.) The 23rd Field Company R.E. left for South Africa in the "Gaul."

,, ,, Launch of torpedo-boat destroyer "Stringham" at Wilmington, Delaware, U.S., for U.S. Navy.

12th (M.) H.M.S. "Edgar" left Portsmouth for Mediterranean with reliefs.

14th (W.) H.M.S. "Fox" arrived at Portsmouth from Cape and West Coast of Africa.

15th (Th.) H.M.S. "Astræa" commissioned at Chatham for Mediterranean.

20th (T.) The Khalifa raided some villages on the White Nile.

,, ,, H.M.S. "Endymion" left Sheerness for China.

,, ,, H.M.S. "Intrepid" arrived at Portsmouth from North America and West Indies.

22nd (Th.) The Khalifa was defeated by friendlies, who captured his only gun.

,, ,, 2nd Bn. West Kent Regiment start from Chatham on their march through Kent.

23rd (F.) H.M.S. "Narcissus" paid off at Portsmouth.

,, ,, Launch of first-class gun-boat "Décidée" at Lorient for French Navy.

24th (Sat.) A Russian military party was massacred by Chinese brigands near Kerin.

26th (M.) H.M. The Queen reviewed the troops at Aldershot.

,, ,, Launch of first-class cruiser "Jurien de la Gravière" at Lorient for French Navy.

27th (T.) H.M.S. "Astræa" left Sheerness for Mediterranean.

,, ,, Launch of torpedo-boat destroyer "Som" from Laird's, at Birkenhead, for Russian Navy.

,, ,, Launch of first-class battle-ship "Hatsuse" from Elswick for Japanese Navy.

28th (W.) Launch of third-class cruiser "Pioneer" at Chatham.

,, ,, H.M.S. "Pallas" paid off at Portsmouth.

Addendum to May Calendar.

20th (Sat.) Launch of first-class armoured cruiser "Gromoboi" from New Admiralty Yard, St. Petersburg, for Russian Navy.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval.* Buenos Aires: May, 1899. —Has not yet been received.

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 7. Pola: July, 1899.—"The Adriatic Sea Fisheries, with particular regard to the Austro-Hungarian Coasts" (*continued*). "The Netherlands Naval Budget for 1899." "Bursting of a Gun on the Range at Sandy Hook." "Foreign Naval Notes."

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: May, 1899.—"The Naval Arsenal of the Capital." "The Veterans of the Paraguyan War." "Some Notes on Ballistics" (*continued*). "Cervera's Misfortunes." "The Chino-Japanese War from the Point of View of International Law." "Naval Notes."

June, 1899.—"Admiral Barroso and the Battle of Riachuelo." "Contributions for a Course of Naval History." "Professor Molfino's Method of Solving Problems of Nautical Astronomy." "The Chino-Japanese War from the Point of View of International Law." "The Veterans of the Paraguyan War" "Naval Notes."

FRANCE.—*Revue Maritime.* Paris: May, 1899—"History of Musketry in the Navy from the time of Richelieu up to the Present Day" (*continued*). "A Study on Maritime International Law: The Convention of 1856." "Leopold Manen, Hydrographical Engineer-in-Chief of the Navy (1829-1897)." "Statistics of Shipwrecks and other Casualties at Sea for the year 1895." "The War in 1900 by Land and Sea." "The Neutrality and Defence of Denmark." "The Russian Battle-ship and Cruisers Constructed in the United States." "Naval Notes." "The Mercantile Marine."

Le Yacht. Paris: 3rd June, 1899.—"Steam Fishing-Boats and Sailing Fishing-Boats." "Yachting Notes." "Petroleum Fuel." "Submarine Boats and the Law of Nations." "Austro-Hungarian Navy" (*continued*). "The Regulations of the Long Island Yachting Association" (*continued*). 10th June.—"Brassey's Naval Annual." "Yachting Notes." "The Portuguese Royal Yacht 'Amelia.'" "The Control of Sea Routes." "The Austro-Hungarian Navy" (*continued*). 17th June.—"The 'Jeanne d'Arc' and English Cruisers." "Yachting Notes." 24th June.—"Coast Defence and the Colonial Army." "Yachting Notes." "Magnetic Influence of Certain Coasts." "The Portuguese Cruisers 'Sao Rafael' and 'Sao Gabriel.'" "The Austro-Hungarian Navy" (*continued*).

Le Moniteur de la Flotte. Paris: 3rd June, 1899.—"Steam Fishing-Vessels." "The Navy in Parliament." "The Return of the Marchand Mission." 10th June. —"The Restoration to the Active List of Retired Officers." "The French Navy League." "The Navy in Parliament." 17th June.—"Majors or Captains of Corvettes." "The Navy in Parliament." "The Pilotage Schools." 24th June. —"Military Occupation of the Colonies." "The Navy in Parliament." "The Return of the Marchand Mission."

La Marine Française.—Has not yet been received.

GERMANY.—*Marine Rundschau.* Berlin: July, 1899.—Frontispiece: "Launch of 'Kaiser Wilhelm der Grosse.'" "Some Short Remarks on Photography on board

Ship." "Boat Lowering Apparatus." "Cooking by Means of Electricity." "The Work of the Navy in the Suppression of the Arab Rising in East Africa." (*concluded.*) "The Latest Nelson Literature." "The Latest from Private Industries." "The Etappen-Routes of England to India and the Cape of Good Hope" (*continued*). "On the Preparation of Carbonate of Soda on board Ship." "Proverbs and Proverbial Methods of Speech about Seamanship, Sea and Fishing Life in the German Language." "Transmission of Orders by Electric Telegraph."

ITALY.—*Rivista Marittima.* Rome: June, 1899.—Has not yet been received.

PORTUGAL. — *Revista Portugueza, Colonial e Maritima.* Lisbon: 20th June, 1899.—"Points in Portuguese History." "Colonial Agriculture" (*continued*). "The Anglo-French Convention of 21st March, 1899" (*concluded*). "Some Short Reflections on the Portuguese Navy" (*concluded*). "Navigation on the East Coast of Africa."

SPAIN.—*Revista General de Marina.* Madrid: June, 1899.—"Coast Defence." "Some Remarks on Submarine Boats." "Some Studies of the Medical Service on board Ship in Expectation of War" (*continued.*) "The Squadron as a Military Entity." "Entrance Examinations." "Instructions." "More on Coast Defence." "The Mounting of Marine Engines" (*continued*). "The Dominion of the Sea." "The New French Armoured Cruiser 'Sully.'"

MILITARY.

AUSTRIA-HUNGARY.—*Militär-Zeitung.* Vienna: 1st June, 1899.—"Our Officers' Messes." "The Unveiling of the Kolin Memorial." "The Rising Generation of Prussian Officers." 9th June.—"The Advance of the Cavalry Division." "Count Leopold Sternberg." "The Hero of Fashoda." 17th June—"The Army School Association." "Custoza." 25th June.—"Reports on the Object of General Knowledge at Cadet Schools." "Trautenau." "The 5-inch Howitzer."

Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens. Vienna: June, 1899.—"The Development of Krupp Field Artillery *Matériel* from 1892 to 1897." "About Railway Detonating Signals, and Safety Protection Caps."

Organ der Militär-wissenschaftlichen Vereine. Vienna: April, 1899.—"The Austrian Military Forces at Crete." "How can Experiments in Field Firing be brought as near as possible to Service Conditions?"

May, 1899—"Maria Theresa: her Army and her People in the Austrian War of Succession." "Thoughts about Instructive Occupation for Soldiers" "Automatic Small Arms."

June, 1899.—"On the Question of the Organisation of Field Artillery." "Peculiarities of the Russian Regulations in the Definitions for Infantry Combat." "The Importance of Fat in the Soldier's Rations."

BELGIUM.—*Bulletin de la Presse et de la Bibliographie Militaires.* Brussels: 15th June, 1899.—"Military Cycling" (*continued*). "The War of the Future, and the Hague Conference." 30th June.—Has not yet been received.

FRANCE.—*Le Spectateur Militaire.* Paris: 1st June, 1899.—"Grand Manœuvres" (two maps, *continued*). "Italian Campaigns in Africa, with some observations regarding a recent work" (*concluded*). "The Battle Preparation of the German Infantry" (*continued*). "Recollections of an Infantry Marine Officer" (*continued*). "Historical Essay on the Russian Army" (*continued*). 15th June.—"Grand Manœuvres" (with six maps, *continued*). "The Battle

Preparation of the German Infantry" (*continued*). "Recollections of an Infantry Marine Officer" (*continued*). "Historical Essay on the Russian Army" (*continued*).

Revue d'Artillerie. Paris: June, 1899.—"Distribution of Artillery Fire." "Field Service Exercises by Battery Groups" (*continued*). "Method for the Employment of a Sand Plane in Relief for the Tactical Education of Troops." "Automatic Pistols" (*concluded*).

Revue du Service de l'Intendance Militaire. Paris: May-June, 1899.—"The French Eastern Sahara." "Contribution to the Study of the Congealing of Meats." "Composition and Alimentary Value of the Principal Vegetables" (*concluded*). "Agricultural Monograph of the Department of the Drôme." "Study of Public Feeding in its Relation to the Feeding of Armies" (*continued*). "Extracts from the Works of Parmentier."

Revue de Cavalerie. Paris: June, 1899.—"Cavalry in Advance of Armies—French Cavalry during the Napoleonic Period." "Our Future Chiefs." "Cavalry in Action in Future Wars." "Reconnoitring Duty of Cavalry" (*continued*). "Harness and Packs." "Long-Distance Rides and Endurance Marches" (with photogravure, *continued*).

Journal des Sciences Militaires. Paris: June, 1899.—"Three Columns at Tonkin (1894-1895)—1. Operations in the Caï-Kinh." "The Drills and the Course of Lectures at the École de Mars." "The Great Frederick" (*continued*). "The Army in 1900—What it is and what it should be—1. The Soldier." "Besançon and the 7th Military Division in 1870-1871" (*continued*). "The War of Succession in Austria (1740-1748)" (*continued*). "The Electric Light and its Employment in War" (*continued*). "With Regard to Disarmament."

Revue Militaire. Paris: June, 1899.—"The Spanish-American War." "Von Moltke—Plans of Operations, Campaign of 1866" (*concluded*).

Revue du Génie Militaire. Paris: June, 1899.—"Military Geography and new Geographical Methods." "Theory and Application of Alternate Currents." "Fortifications." "Military Ballooning in England."

Revue du Cercle Militaire. Paris: 3rd June, 1899.—"From the Atlantic to the Red Sea" (with photographs and a map). "Coast Defence" (*continued*). "The Recollections of a German Army Surgeon" (16th August, 1870). "Preparation of the Section for its *rôle* of Combined Fire Action" (*concluded*). 10th June.—"The last Defenders of Canada." "Coast Defence" (*continued*). "Criticism on Manœuvres" (*concluded*). "Recollections of a German Army Surgeon" (16th August, 1870) (*concluded*). 17th June.—"The last Defenders of Canada" (*concluded*). "The Officers of the Russian General Staff." "Coast Defence" (*concluded*). 24th June.—"The Recruiting Service." "The Conference at the Hague." "The Napoleonic Battle." "English Bullets" (with sketch).

GERMANY.—*Militär-Wochenblatt.* Berlin: 3rd June, 1899.—"The Strategic Importance of Switzerland." "Mémoires du Général Baron de Marbot" (with map). "The Chart Department of France" (*concluded*). 7th June.—"To the Fiftieth Year's Service Jubilee of His Highness Henry VII., Prince of Reuss, formerly General of Cavalry and Aide-de-Camp to His Majesty the Emperor and King William I., on the 9th June, 1899." "The Strategic Importance of Switzerland" (*concluded*). "Some Details of the Duties of Officers, from Company Commanders downwards, regarding the Health of their Men." 10th June.—"Some Details of the Duties of Officers, from Company Commanders downwards, regarding the Health of their Men" (*concluded*). "The Anglo-Russian Dispute about the Northern Chinese Railway." 14th June.—"Our Cavalry in the Next War." "The Means of Ascertaining the Results of Individual Firing." "New Process of Army Inspection in France." 17th June.—"The Bombardment of Paris, 1870-71, and the Causes of its Delay." "Our Cavalry in the Next War" (*concluded*). "Balloon Observation" (with a sketch). "The Bay of San Mun

and its Hinterland." 21st June.—"Publications of the French General Staff." "Prince Henry as Commander-in-Chief in the Seven Years' War." "Field Artillery Tactics from 1874 to 1898." "New Modifications in the Calling-out of the Praporschtschiki of the Reserve." "Changes of Command in Egypt." 24th June.—"In Remembrance of the 24th January, 1899" (with picture). "Scouting." "The Gymnastic Education of Soldiers through Muscular Development." "The Formation of a New Caucasian Army Corps in Russia." 28th June.—"Superiority of Numbers." "Infantry Tactics."

Deutsche Heeres-Zeitung. Berlin: 3rd June, 1899.—"Remarks on Admiral Makaroff's Opinion Regarding Ironclads." "The New Yacht of the Queen of Great Britain and Ireland" "South Tyrol and its Defences in the Year 1866" (*continued*). 7th June.—"Some Matters from French Instructional Books." "The Panama and Nicargua Canal from a Strategic Point of View." "South Tyrol and its Defences in the Year 1866" (*continued*). 14th June.—"The Explanation of General von Voigts-Rhetz, of the Artillery, in the 37th Number of the *Militär-Wochenblatt.*" "Some Matters from French Instructional Books (*concluded*). "South Tyrol and its Defences in the Year 1866" (*concluded*). "'War,' by Johann von Bloch." 17th June.—"The Explanation of General von Voigts-Rhetz, of the Artillery, in the 37th Number of the *Militär-Wochenblatt*" (*concluded*). "'War,' by Johann von Bloch" (*continued*) 21st June.—"'War,' by Johann von Bloch" (*concluded*). "About Fortresses." "Armour-Plate Trials in America." 24th June.—"About Fortresses" (*continued*). "The Employment of Railways in the Next War." "About the Meaning of Waterways in General, and the Importance of the Projected Rhine-Elb Canal for Military Purposes." 28th June.—"The Want of a Steady War Ministry in France." "About Fortresses" (*continued*). "The Employment of Railways in the Next War" (*continued*).

Jahrbücher für die Deutsche Armee und Marine. Berlin: June, 1899.—"The Energy of von Moltke as Chief of the Staff" (*continued*). "Tactics and Technicality in War" (*continued*). "Some Thoughts on the Assault on Fortified Fieldworks. "The Italian Army and Navy in the latter half of the year 1898." "Army and Navy News from Russia." "The Holding of Outposts from an Enemy's Assault."

Internationale Revue über die gesammten Armeen und Flotten. Dresden: June, 1899.—"Advanced Positions." "The Influence of Armour-plating on Modern Fortifications." "The Organisation of the Scientific Branches" (*concluded*). "Criticism of the Russian Manœuvres of 1898." "Results of the Græco-Turkish War of 1898" (*concluded*). "Greece." "China and the Great Powers." "Japanese Army of the Present and Future." "Samoa."

Neue Militärische Blätter. Berlin: May, 1899.—"A Few Thoughts on Military Individual Training." "Condition and Temper of the French Army" (*concluded*). "A Burning Question—The Submarine Boat." "Sketches from the Russian Army" (*continued*). "Wooden Ships in the Navy in 1899." "An Order-Book of von Schill's Light Infantry Battalion from the Year 1807 to 1809." "Russia and Finland." "The New English Naval Budget." "The Foreign Armies and Navies at the Disarmament Conference."

June, 1899.—"The Future War in its Technical, Economic, and Political Aspect." "Tripoli." "A Contribution to the Cavalry Question." "Russia's Forces in Eastern Asia." "An Order-Book of von Schill's Light Infantry Battalion from the Year 1807 to 1809." "Sketches from the Russian Army" (*continued*).

ITALY.—*Rivista di Artiglieria e Genio.* Rome: June, 1899.—"Tactical Exercises of Field Artillery at the Firing Ranges." "The Distribution and Charge of Laboratory Stores at the Artillery School of Firing." "Geographical and Hydrographical Study of Erythrea." "Notes on the Method of Elevating Guns for the Fire of Coast Batteries." "Organisation of Coast Batteries in

Russia." "Some Notes on the Central Firing School for German Field Artillery." "The Prussian Military Schools." "Some Rules in regard to Gun Pressures."

Rivista Militare Italiana. Rome: 1st June, 1899.—"The Army and Fortifications." "On the Book 'The Grandeur and Decadence of War.'" "The Odyssey of the Antilles." "Politico-Military Notes." 16th June,—"The Army and Fortifications" (*concluded*). "On Infantry Fire." "Military Education: On a Method for the Theoretical Instruction of Troops." "On the book 'The Grandeur and Decadence of War'" (*concluded*). "Politico-Military Notes."

RUSSIA. — *Voïénnyi Sbórnik.* May and June, 1899.—Have not yet been received.

SPAIN.—*Memorial de Ingenieros del Ejército.* Madrid: May, 1899.—"The Bay of Algeciras." "Effect of Metal Frames on Mortar and Plaster." "Electricity —Problems relative to the Employment of a number of Primers" (*concluded*).

June, 1899.—"The Bay of Algeciras" (*continued*). "The Food of the Soldier."

Revista Técnica de Infantería y Caballería. Madrid: 1st June, 1899.—"The Cavalry." "Past Greatness." "Marches to Test Endurance." "On the Education of the Soldier." "Independent Cavalry before Water-Courses" (*continued*). 15th June.—"On Field Artillery and the Battles of the Future." "The Virginius and General Jovellar." "Cavalry Marches." "The Drills and Military Walks of the VI. Army Corps." "Independent Cavalry before Water-Courses" (*concluded*).

SWITZERLAND.—*Revue Militaire Suisse.* Lausanne: June, 1899. — "The Blockade of Sphacteria according to Thucydides" (*concluded*) "Infantry Tactical Instruction." "Jointed Trestles for Field Kitchens." "The Russian Artillery."

NOTICES OF BOOKS.

BALCK'S TACTICS: (*Balck Taktik, I. Theil.* 1ter *Halbband.* M. 4.

Einleitung und formale Taktik der Infanterie. 2ter *Halbband.* M. 4.80.

Formale Taktik der Kavallerie und Artillerie.) Berlin: R. Eisenschmidt, 1897. Small 8vo, pp. 528.

"German military literature possesses no large comprehensive work on Tactics," says Captain Balck, in opening his brief preface. It is easy to picture the sceptical but well-disciplined smile of derision on the faces of our German comrades as they read this astounding statement. Have we in this country then laboured in vain for twenty years and more in wading through volume after volume of German military literature? Are the works of von Boguslawski, von Scherff, von Verdy du Vernois, von Schellendorff, von Schlichting, von der Goltz, Hoenig, Kunz, not comprehensive? At any rate, Captain Balck's text-book is so. In Part I., before us, he deals exhaustively with the "formal tactics" of the three arms separately. In Part II., which we will review later on, he treats of "combined tactics," the co-operation of the three arms on the march, bivouac, and in battle.

The author publishes his book, he says, because Meckel's "Taktik" is out of date. Yet Balck but elaborates principles asserted years ago by Meckel. We wish he had imitated Meckel's admirable conciseness. In a work of this importance surely much of the detail to be found in the drill-books might have been omitted, without detriment to the merits of the work, which are indisputable.

That it is thorough cannot be gainsaid. That it is interesting cannot be denied. The reasons for the formations adopted are explained. Their use is

illustrated by many examples from military history. "Military history," says the author, quoting an Austrian writer, "depicts for us what the most inspired theory fails to do: the friction, the influences, the doubts and difficulties, the unforeseen accidents and surprises, and the ways commanders and practical soldiers have taken to meet these." He acknowledges the difficulty of selecting historical examples, which are infinite in their variety, and he confines himself chiefly to those taken from the wars of 1866, 1870-71, and 1877, as he says "only modern military history furnishes sufficient details." "Tactical problems alone will not suffice, as these become in time as well known as manœuvre ground that has been continually worked over" (*e.g.*, our Aldershot Fox Hills).

The numerous examples are partly scattered through the text and partly given in small print notes at the foot of the page. This makes the matter more readable, and is sufficient for those well versed in military history; but we prefer the method of the "Leitfaden" (reviewed in this JOURNAL, January, 1898), where the theory is shortly stated in the text, and reference given to a few examples, which are worked out with the aid of outline sketch maps in sufficient detail in a separate volume to be studied at the same time. Without such sketches and details, instances cited as examples may lose their point. We make bold, therefore, to suggest to the talented and industrious author that he supplement his valuable work with a handy small atlas of outline-coloured maps, on a scale of about $\frac{1}{50000}$ in the order mentioned in his text, with dates, etc., showing the ground where the battle incidents referred to took place.

The author's wealth of information is immense. With painstaking thoroughness he gives in comparative tabular form some details of organisation of German, Austrian, Italian, French, and Russian infantry units, their equipment, regimental transport, rates of march, frontage in action, etc. He explains the principles of action and the formations in use in the different Armies, so, as the infantry portion has been translated into English, it will be our officers' own fault if they remain in ignorance of at least the chief points of contemporary foreign tactics. Napoleon showed that when you have mastered your enemy's tactics you are on the high road to victory. "How to Fight the French," a pamphlet issued by Prince Frederick Charles, before 1870, had not a little to say to the German successes.

The author alludes to the views of von Scherff, von Schellendorff, Keim, and others, in regard to the debated question: attack normal or otherwise; his own opinion being in favour of the German Infantry Drill-Book view. Indeed, he says, in giving a sketch of the methods of attack in use, that the Russian is the only Army that retains a purely "normal attack." The Russians have, however since 1896, been experimenting with a new provisional drill, so theirs too may disappear.

Notwithstanding the difficulties and dangers of the offensive in the face of well-armed, well-trained troops in a good position, the author is of opinion that the offensive is essential to victory. How success can be obtained he shows by enumerating certain principles which govern the method to be followed. These do not materially differ from those in the English infantry drill. He cites numerous examples which illustrate the soundness of these principles.

Ever since the publication of "The Tactical Retrospect" (May) in 1866, and of "The Art of Operating under Fire" (Tellenbach) in 1871, tacticians have been busy with the problem how to diminish loss under the present rapid and accurate fire; and the author has faced this question. He discusses the methods of advancing by rushes, and by creeping forward, the proper size of units and sub-units, and the methods of reinforcement.

On the whole, his conclusions seem similar to those of Major Tellenbach. He gives instances of the confusion caused by losses under fire in 1877 and 1885 in Bulgaria, and notices that the losses were often less at 500 yards from the position than at 1,500. The defender was perhaps packing his little bag and preparing to go by the time the former distance was reached.

In discussing the abolition in the French and Russian Armies of the *supports* of the firing line, the author thinks that, on the whole, it is better to retain the supports for the long advance, provided they are extended and kept far enough back at first; but that, if a company joins in a fight at decisive (infantry) distance, it should be an extended, as a firing line.

The English cautious principle of keeping a portion of the reserves in hand, even in the case of successful attack, does not meet with his approval. He thinks that as the last grain may turn the balance, so should every man be brought up for the final dash. We think the precaution a wise, not a timid, one. Who can tell what surprises may await a successful attack even in the moment of victory? Did not the Austrians at Marengo, flushed with apparent success, let go their cavalry reserves and suffer defeat? Our rule is a sound one. A successful commander on the spot may disregard it, if he judges it essential to do so.

It is impossible to dwell upon the various phases of attack and defence that Captain Balck goes into; but the *counter-attack* appears to us to be more satisfactorily dealt with than in other tactical works. Numerous examples are given exemplifying the how, when, and where of counter-attacks and of the grand counter-stroke, especially naming the counter-attack by General Bataille on the Stirring Copses at the battle of Spicheren, 6th August, 1870, and instancing the frontal counter-attacks of the English at Maida, Busaco, and Waterloo, followed by a quick resumption of their defensive positions.

Though doubtless well known to studious artillery officers, many infantry officers are probably unacquainted with Lieut.-General Rohne's works on the comparative effects of artillery and infantry fire, from which useful extracts are made for the purposes of this book. The number of rounds carried are given in detail, and the supply of ammunition regulations in the chief European Armies are epitomised. The English system is considered too complicated. The number of cartridges expended in several battles and combats by the German infantry are given. The French expended much more. At Champigny they shot away about 118 rounds per man. Some of Grenier's division, which repulsed the attack of the 38th Brigade at Vionville, expended 150 rounds per man.

At Slivnitza the Servians shot away nearly all their ammunition at long ranges, and had to evacuate the positions they had taken. The 4th Battalion 4th Bulgarian Regiment fired off 185 cartridges per man before they came within 500 yards of the enemy.

The space at our disposal does not admit of more than a glance at the CAVALRY and ARTILLERY volume, but this is sufficient to show the thoroughgoing character of the work. Here, again, much space is taken up with the detailed formations from the drill-books, with diagrams. Cavalry organisation is detailed and discussed. It is considered that a cavalry regiment must consist of at least four squadrons, each having 150 horses, and a reserve squadron to maintain efficiency. The absurdity of a regiment with only three service squadrons is not even contemplated. The highest training of officers and men, and mutual reliance, only born of continuous co-operation and constant practice, are necessary to the perfection of this indispensable arm, the achievements of which in battle are recorded from Kunz, Hoenig, and others. The rules for attacking infantry and artillery used in different Armies are given. The capture of a French battery by a squadron of the 11th Lancers at Loigny (2nd December, 1870), and the action of three squadrons of the 5th German Cuirassiers at Tolitschau (15th July, 1866) are cited as patterns to go by.

The attack against cavalry, as carried out by different nations, is described. That of a German division is a revival of Frederick the Great's system. The division consisting of three brigades, each of two regiments, attacks in three lines, the first being the strongest with a front of about 1,000 yards. The Austrian cavalry division covers a front of 980 yards and attacks with "defensive flanks" (as

in English cavalry division), the third line is a quarter of the whole, and is kept back at first 550 yards and to a flank. The French cavalry division is formed for attack in three lines of equal strength. Diagrams showing the formations are added. The Cossack methods of attack, especially the so-called "Cossack Lara," a squadron advancing with half-extended files (four paces interval), covering the front, followed at about 150 paces distance by a small rallying group with the colour, are well described.

The dismounted action of the German cavalry, which is similar to that of the British service, and that of the other chief Powers, is sketched, and some examples from war are given.

The ARTILLERY portions of the book seem very well done. The organisation by regiments and *abtheilungen* (four batteries answering to our brigade divisions), is described. Five gun batteries are preferred to four. The breaking up a battery except in hill warfare and in street-fighting, is deprecated. The isolation of guns in gun-pits in defence, as the French and Russians do, is condemned as preventing mobility and concentration. The effect of artillery fire on infantry and the other arms is gone into in great detail, numerous examples from war being cited and the works of Langlois and Rohne referred to. Ideal artillery positions in attack and defence are described, but a warning given not to lose time in looking for ideal positions. A dusty position may do away with the advantage of smokeless powder. Quick-firing field guns are but briefly alluded to. Perhaps the author, being in an official position, had to practise reticence, for two years ago nearly as much was known about the German quick-firer as now. However, British artillery officers know as much about quick-firers as their foreign comrades. Most nations are but experimenting with these, the French alone having definitely adopted a real quick-firer (a 7-pounder).

The author fully describes the methods of fire and ammunition supply in the different Armies, and the means of conveying orders.

It will be seen from the above necessarily condensed summary what a comprehensive work Captain Balck's is. Enriched as it is by examples from war, its value as a work of reference is undoubted, though this would be enhanced by an index, which, like most German tactical works, it is without.

The enterprising English officer who has translated the infantry volume deserves credit for having supplemented this want in his excellent translation (published by Sands & Co.), which, though occasionally too free, has admirably caught the spirit of the author, and to which his own annotations lend additional interest.

The Naval Annual, 1899. Edited by the Hon. T. A. BRASSEY. Portsmouth. 1899.

The Naval Pocket-Book. Edited by L. G. CARR LAUGHTON. London. 1899.

Aide-Mémoire de l'Officier de Marine. Edited by MM. DURASSIER and C. VALENTINO.

Almanach für die K. u. K. Kriegs-Marine. Edited by the Director of the Hydrographical Section. Pola. 1899.

All the World's Fighting-Ships. By F. T. JANE. London. 1899.

Want of space prevents our noticing in detail the above different works of reference, valuable as they all are in these days when so many people take an interest in naval matters and show a natural curiosity to learn what they can, not only about our own ships but also those of foreign Powers, against whom we may some day unfortunately find ourselves pitted. We give the place of honour to Brassey's "Annual," because undoubtedly this valuable work in some respects stands on a somewhat higher platform than do its rivals, in view of the important contributions on naval subjects written by well-known experts, which form such a prominent feature of the book. In this year's edition the papers on "British

Coast Fortifications," and "Marine Engineering," by Mr. Dunell, on "The Operations of the Gun-boats during the Nile Expedition," and "The Naval Aspects of the Spanish-American War," by Sir G. Clarke, are all well worth reading.

The comparative tables of British and Foreign War-ships are useful, and this year there is a decided improvement in the method of arrangement. But we fail to understand why the "Nile" and "Trafalgar" are classed as second-class battle-ships, while ships like the French "Brennus," and the "Carnot" with her four sisters, the Russian "Sevastopol" and her two sisters, the German "Brandenburg" class, the Italian "Sicilia" class, and the U.S. "Indiana" with her two sisters, are all considered first-class ships; it is absurd to put two such ships as the "Nile" and "Trafalgar" in the same category with the French "Courbet," "Devastation," or the "Neptune" class, or with the Russian "Sissoi Velikie," "Rotislav," "Nicolai I." and "Alexander II.," as has been done. The classifications of many of the cruisers is equally incomprehensible, the seven powerful belted cruisers of the "Undaunted" type, for instance, being put in the same category as the feeble vessels of the "Amphion" and "Mersey" classes.

There is a serious discrepancy between Brassey and the other works of reference we have put in our heading in this notice. With regard to the heavy armament of the new Italian battle-ships of the "Regina Margherita" type, Brassey credits them with carrying four 12-inch guns in turrets, two forward and two aft; all other authorities give them two 12-inch guns only in the after turret, two 10-inch guns being carried forward; and we believe this to be correct, as special attention was drawn, at the time the design of these ships was made known, to this particular feature of their proposed armaments, and from enquiries we have instituted we cannot learn that any alteration has been made. Time however will show, and Brassey may prove to be right; such discrepancies are bound to occur, and they are useful, because they serve to draw attention to disputed points and the truth is sure to be sooner or later ferreted out.

As is always the case, the illustrations in the "Annual" are particularly good, and we fancy are more numerous than usual. Altogether, the editor may be congratulated on the result of his labours, for this year's edition fully maintains the high standard of excellence for which this well-known work of reference has been now for some years past justly famed.

The "Naval Pocket Book" was brought out first four years ago by Mr. Laird Clowes, but it has now passed under the editorship of Mr. Carr Laughton, and it ought to have a good future before it. It is a very convenient size, far more so than Brassey's "Annual," and contains a vast amount of very useful information, condensed in a very small amount of space. The classification of the ships is good, and fuller details about armour, armament, etc., are given, than are to be found in Brassey or any other of its rivals. The list of dry-docks in all parts of the world, trial-trip tables, and the tables and notes on guns, small-arms, and torpedoes, are extremely useful for purposes of reference and add much to the value of the book. The great fault of the "Pocket-Book," but it is one that can easily be remedied, is the badness of the paper on which the plans of the ships are done. We hope Mr. Laughton will see to this in his next edition.

It is hardly necessary to draw attention to Durassier's "Aide-Mémoire de l'Officier de Marine" and the "Almanach für die K. u. K. Kriegs-Marine," as the merits of these two excellent and ably-edited works of reference are well known to all who take an interest in naval matters and who wish to obtain accurate information about the ships of all countries. The comparative strength of the various principal Navies, given in Durassier, may well be read side by side with those of Brassey, while the chapters on International Law, War-ship Construction, Torpedoes, and the Tables of Submarine Cables are full of useful information, well condensed. As usual, the "Almanach für die K. u. K. Kriegs-Marine" carries off the palm for the excellence of its profile and deck plans of the principal war-ships of the world.

"All the World's Fighting-Ships," by Mr. F. T. Jane, is a work of reference which stands on a different footing from those we have been briefly noticing above. The book is quite unique, all the information about the method of classification, and the explanatory notes relative to guns and armour, being given in French, German, and Italian, as well as in English. When we say that illustrations are given of every type of war-ship in all the Navies of the world, special pains being taken to point out any peculiarity of funnels, masting, etc., which may assist towards identification, it will be seen what amount of labour and love Mr. Jane must have thrown into his book. Some of the plans and illustrations are rather rough, but for all that the work is an invaluable one, and the demand for it ought to be very large; we hope it is, so that Mr. Jane will feel that the trouble and time he must have devoted to bringing it out are properly appreciated.

Russia on the Pacific and the Siberian Railway. By Vladmir. Demy 8vo. London. 1899.

Manual for the Royal Army Medical Corps. Army. Crown 8vo. London. 1899.

Sketches and Studies in South Africa. By W. J. Knox Little. 8vo. London. 1899.

L'Empire Libéral. By Émile Ollivier. Tome IV. 8vo. Paris. 1899.

Report from the Agricultural Committee on National Wheat Stores, 1897-98. Fcap. fol. London. 1899.

Digest of Services of No. 18 Company Eastern Division, Royal Artillery. Army Records. By Major J. H. Leslie, late R.A. Fcap folio. Sheffield. 1898.

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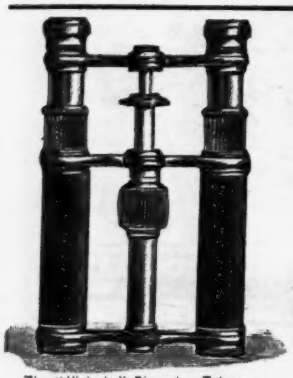

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